ROADS AND STREETS

How CLEVELAND TRENCHER COMPANY mounts the track rollers of its Model 320 trencher on Timken bearings to assure long life and minimum maintenance.

Crawler trencher digs 4' ditch 7½' deep with help of 68 TIMKEN® bearings

THIS Model 320 is reported to be the only crawler type trencher that can dig a 4' ditch 7½' deep at the rate of 10 to 12 lineal feet per minute. To keep its many moving parts operating, with minimum maintenance and time-out on the job, Cleveland Trencher Company uses a total of 68 Timken® bearings in the differentials, transmissions and track rollers.

Timken tapered roller bearings take radial and thrust loads in any combination, hold shafts in rigid, positive alignment. Proper gear meshing and a smooth flow of power is assured.

Because they keep housing and shaft concentric, Timken bearings make closures more effective. Lubricant stays in, dirt stays out—reducing wear and maintenance.

Timken bearings provide extra load carrying capacity because of line contact between rollers and races. They normally last the life of the machine because they're engineered for the job, precision manufactured and made of special analysis Timken fine alloy steel.

No other bearing can give you all the advantages you get with Timken tapered roller bearings. Make sure you have them in the machines you buy, or the machines you build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

TWO TS 300 MOVE 247,000 YARDS MOTOR SCRAPERS in Ten weeks!

You can get production like this with LaPlant-Choate MOTOR SCRAPERS

HERE are a few of the reasons why you can be sure of big-production profits when LPC Motor Scrapers are on the job:

- Big capacity . . . 14-yds. struck and 18-yds. heaped . . . to haul bigger pay loads.
- Over 22 mph for speed on the haul road.
- Your choice of a 280 HP Buda or a 275 HP Cummins diesel for fast acceleration and extra power when you need it.
- Easy loading characteristics that cut valuable seconds off your cycle time.
- Big interchangeable tires for extra traction and flotation.
- Extra high apron lift and positive forced ejection for faster, smoother spreading.

Your LaPlant-Choate distributor can show you other Motor Scraper features that keep you ahead of schedule with lower overall costs. See him before you bid on your next job.

That's the record of CONCRETE MATERIALS & CONSTRUCTION COMPANY'S

two LaPlant-Choate Motor Scrapers on a stripping job near Cedar Rapids, Iowa.

The normal work week of the two TS 300s was 20 hours a day per unit, 6 days a week. Material moved consisted of sandy clay. Hauls started at 500 ft. and gradually lengthened to 1000 ft. as the job progressed. Grades varied, running as high as 30% at the start of the job.

No wonder Concrete Materials is sold on Motor Scraper performance. They originally bought two TS 300s in September of 1947, worked each unit 18,000 hours on the toughest kind of jobs, and were so well satisfied with the performance records they traded the original units for two new TS 300 Motor Scrapers.

Since February of 1951 when these new rigs went into service, they have worked a total of 6200 hours, with only 430 hours of downtime. *That's 93% efficient,* another reason why there are so many repeat orders for LaPlant-Choate Motor Scrapers.

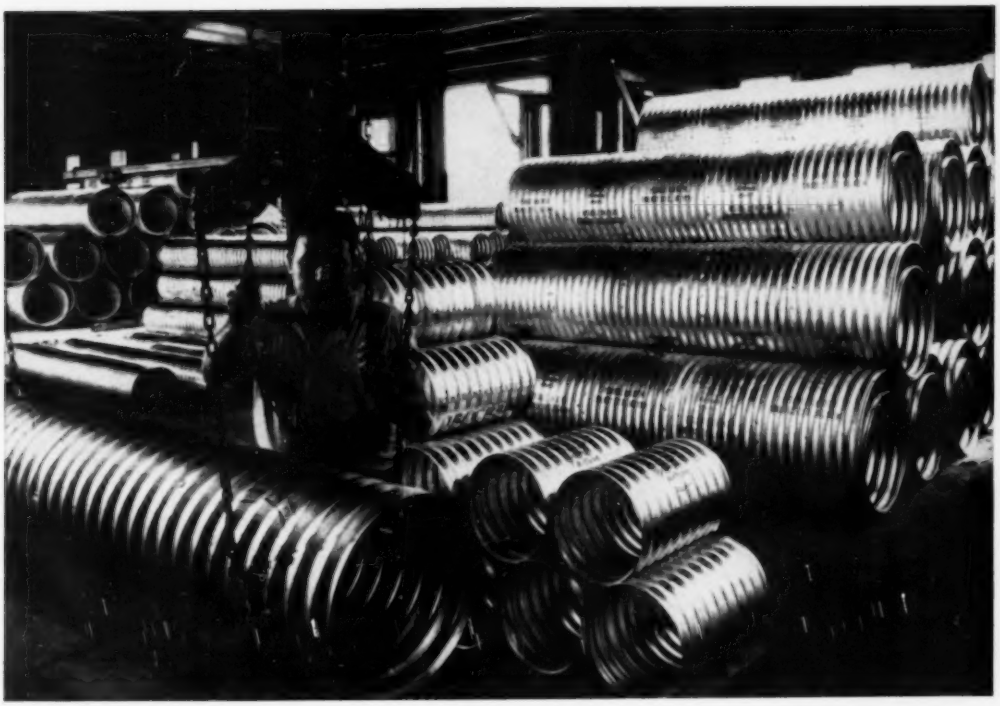
LAPLANT CHOATE

MANUFACTURING CO., INC. ® CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.



Why it pays to use Culvert Pipe made of *GALVANIZED STEEL*

Culvert pipe made from galvanized steel is generally priced lower than pipe made of other materials. This means an initial savings to the contractor on a drainage job.

Galvanized culvert pipe weighs considerably less per foot and is easier to ship than other kinds of pipe. Because it comes in longer sections, fewer field joints are required. It is light enough to be unloaded and placed into trenches with ordinary hoisting equipment. These advantages, of course, reduce the contractor's installation costs.

Culvert pipe made of galvanized steel has other important advantages. It can withstand the impact and vibration of overhead traffic. It has the flexibility needed to conform to the grade and maintain alignment. It has excellent resistance to corrosion.

Bethlehem does not manufacture culvert pipe, but does produce galvanized corrugated steel stock used by fabricators of culvert pipe. This stock contains .20 to .30 pct copper and is sold under the name Beth-Cu-Loy. It is hot-dip galvanized with a 2-oz coating of zinc as determined by the triple-spot test. Beth-Cu-Loy conforms to the rigid standards for culvert sheets set by the American Association of State Highway Officials.

You can find out more about culvert pipe made of Beth-Cu-Loy galvanized steel from any Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETH-CU-LOY
GALVANIZED
CULVERT SHEETS

BETHLEHEM STEEL

ROADS AND STREETS

January, 1952 • Vol. 95 • No. 1

Roads and Streets represents 60 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

E. S. GILLETTE, Publisher ECA HALBERT P. GILLETTE, Editor-in-Chief

H. J. CONWAY, Assistant Publisher

Coming Articles

How Would You Move Shallow Cemented Soil?

These contractors used a 22-ton ripper with good success. First of a new series of job articles on current military airport work.

Shipping and Setting Record Girders for Turnpike Bridge

How Bethlehem Steel Co. and Bigley Brothers, cartage experts, did it for the Passaic River Bridge, where plate girder sections sometimes measured 178 ft. long.

Big Paving Program for Fast Growing Albuquerque

$7,000,000 in new assessment street work believed a record for cities this size. Article coming.

How Much Will the Approach Fills Settle?

An excellent analysis of this problem, an important one for grade separation structures involving high fills on compressible soils.

Lime Stabilized Soil Base Construction for Army Posts

Post road and street program by Army engineers in Texas based on experimental program using lime and lime-cement addition to soils.

Also:

Miles and miles of new streets for spectacular new subdivision; how graded and paved in jig time . . . Savin's famous rail "loop" plant set-up for the Jersey Turnpike . . . 208 ft. high concrete piers for Kentucky highway bridge . . . California methods of controlling welding quality on welded steel bridge erection . . . Nebraska tries fly ash in pavement concrete . . . More job kinks . . . Reports on Highway Research Board, ARBA, AED and other winter meetings.

In This Issue

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundation and grade separations, and to the construction and maintenance of airports.

GILLETTE PUBLISHING COMPANY

Publication and Editorial Offices
22 West Maple Street, Chicago 10, Ill.

Chicago Office..... S. A. Phillips, Sales Manager, 22 W. Maple St.
R. T. Wilson, Mid-West Manager
M. B. Nylund, Western Manager
E. Bender, Clearing House Manager
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New York Office..... H. D. Crippen, Eastern Manager, 155 E. 44th St.
F. A. Michel, Jr.

Cleveland Office..... Lee B. McMahon, Manager, Leader Building

Western Office..... J. A. Osborne, 1126 Del Rey, Pasadena 8, Calif.

Acceptance under Act of June 5, 1934, Section 3484 P.L. & R. Authorized April 16, 1948, at Mount Morris, Illinois. Published monthly. Subscription price $5.00 per year.

DEARBORN ROAD MAINTAINER

Dearborn EQUIPMENT

Keeps Roads Up..Costs Down

DEARBORN HEAVY-DUTY LOADER WITH HYDRAULIC BUCKET CONTROL

The third cylinder of this versatile Dearborn Heavy-Duty Loader enables the operator to control the angle of the material bucket at all times . . . in any position.

DEARBORN ANGLE DOZER HAS ADJUSTABLE ANGLE AND PITCH

Cutting width of the Dearborn Angle Dozer is 6 ft. with blade not angled, 5 ft. when angled. Ford Tractor Hydraulic Touch Control lifts or lowers the blade.

It can give "washboardy" road surfaces a "shave," to make motor traffic smooth, safe, comfortable. It can clean and reshape ditches, trim berms, blade surfacing materials on repair or construction.

The new Dearborn Road Maintainer can do all of these things because it's built like a motor grader. Long wheel base for effective blading. Strong frame to give firm circle support. Weight concentrated on the drive wheels for traction. These are features of big, high-priced motor graders! Yet the Dearborn Road Maintainer costs less to own and to operate than any comparable maintainer offered today.

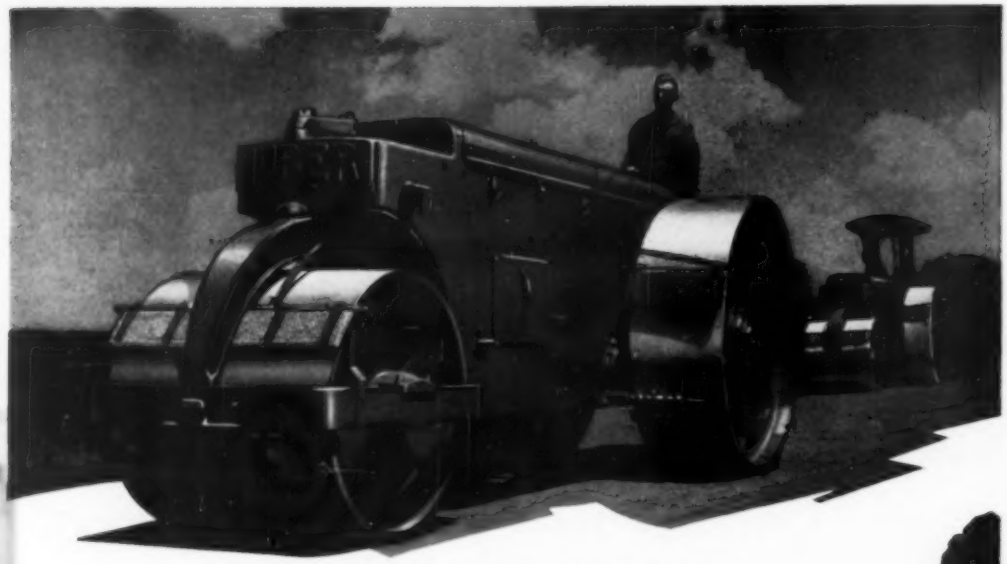
This versatile Maintainer is Ford Tractor powered. Full range vertical blade positioning is under responsive hydraulic control powered by a separate pump. Accessory equipment is controlled by the Ford Tractor's hydraulic mechanism.

For complete information write Dept. I, Dearborn Motors Corporation, or get in touch with your nearby Ford Tractor dealer.

Ford TRACTOR

DEARBORN MOTORS CORPORATION

Birmingham, Michigan



Solve Compaction Problems

EFFICIENTLY, QUICKLY, DEPENDABLY

With

HUBER GENERAL - PURPOSE 3-Wheel ROLLERS

8-10-12-14 TONS • GASOLINE-DIESEL

Since Huber pioneered the "automotive-type" roller in 1923, it has led the industry in the refinement of these versatile machines. Huber has made 3-wheel rollers truly general purpose machines.

FOR GRADE WORK, the Huber 3-wheel is widely used for compaction of earthworks, embankments, sub-grades, trenches and insulation courses. These rollers usually are equipped with 18" face rolls on the 8-ton units, and 20" face rolls on the 10, 12, 14 ton sizes to gain maximum compaction per lineal inch.

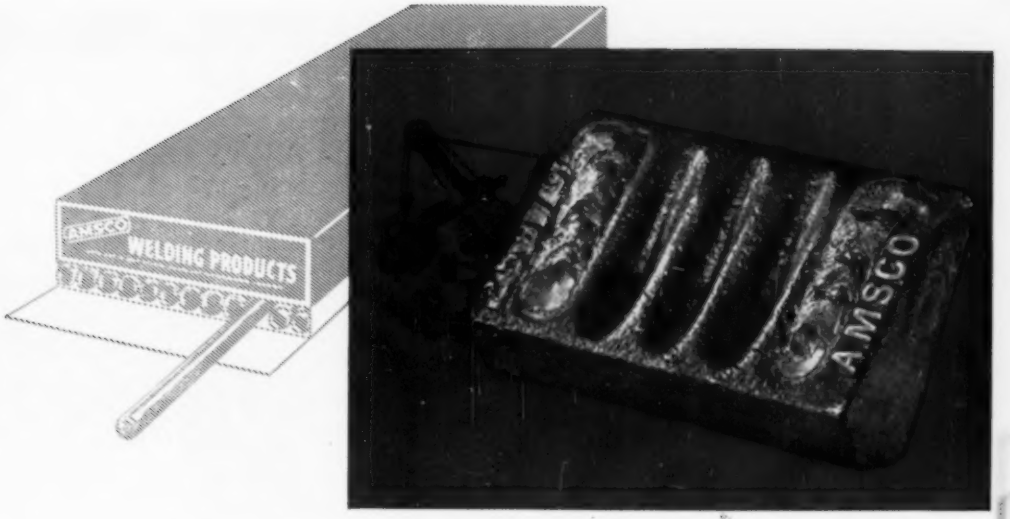
FOR FINISHING, Huber 3-wheel rollers normally are equipped with the wide face rear rolls where high compression per lineal inch is not required and the wider rolling width is desirable. They are in wide use for rolling water bound macadam, surface treatment, sheet asphalt and ahead of tandems on asphaltic concrete and other bituminous mixtures.

For more information about Huber GENERAL PURPOSE 3-wheel rollers, ask for our new 20-page bulletin, No. H-150.

HUBER MANUFACTURING CO. • Marion, Ohio, U. S. A.

Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

HUBER



NOW! Wear your point and have it too!

This new catalog can help you save money on repair costs . . .

It's packed with information on the new "Wear-Sharp"—and the entire AMSCO Weldment line. Complete with installation instructions and helpful hints on welding. Be sure to ask for your free copy.

AMSCO "Wear-Sharps" are available in two quickly and easily installed types:

Crescent Back
For application to worn tooth with minimum fitting.

Straight Back
For application after worn tooth is beveled.

U. S. Pat. No. 2,247,202

New AMSCO "Wear-Sharp" repointer holds a straight edge as it wears . . . and stays sharp longer!

Here's a new tooth repointer that is just what you've been looking for . . . the AMSCO "Wear-Sharp", *and it does exactly what the name implies.*

Note the groove design on this new repointer shown above. The outside and end grooves are AMSCOATED with Amsco Hardfacing Electrodes specially recommended for this purpose, while the inner grooves are left as they are. Result?

The Amscoated grooves wear slower, thus equalizing wear along the entire cutting edge and making the point stay sharp longer. Rounded, blunted corners that cut digging efficiency and waste power are completely eliminated for the life of the repointer!

The "Wear-Sharp" is already setting new records in service life and digging efficiency. For example, an Eastern mine reports *6 times longer service than any repointer ever used before.*

The next time your dipper teeth need repointing, try the new "Wear-Sharp"! Write today for illustrated catalog shown at left—and name of your nearest AMSCO Distributor.

AMSCO WELDMENTS
THE RIGHT WAY TO MAKE REPAIRS

AMERICAN **Brake Shoe**

AMERICAN MANGANESE STEEL DIVISION
406 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

STRIKE THIS BLOW MAINTENANCE

HAMMER TEST: Put a lump of *Texaco Marfak* about the size of a walnut on a smooth, solid surface. Then hit it as hard as you can with a good-sized hammer. See how *Texaco Marfak* cushions your blow, does not splatter. That's because *Texaco Marfak* is both adhesive and cohesive. It clings to the surface and *holds together* — a dramatic demonstration of how it stays in the bearings and protects chassis parts under the pounding of the roughest service.

See why chassis parts last longer with TEXACO MARFAK

Make the famous *Texaco Marfak* "Hammer Test" as described above. Note how *Texaco Marfak* cushions your hardest blows. The wonderful cohesive properties of *Texaco Marfak* prevent it from splattering like ordinary grease.

So it is in your chassis bearings. *Texaco Marfak* withstands the poundings of roughest roads . . . stays in the bearings for extra hundreds of miles . . . seals out dirt and moisture. *Texaco Marfak* stretches parts life because its tough, tenacious lubricating film gives better and longer lasting protection against wear and rust. Your maintenance dollars go farther.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals itself in, seals out dirt and moisture for longer lasting protection. Will not leak onto brakes. No seasonal change required.

For Additional Economies

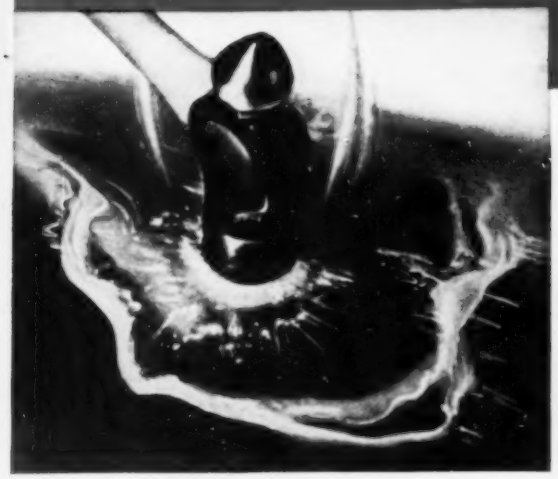
For engine economy, lubricate with *Texaco Ursa*

TUNE IN . . . TEXACO STAR THEATER starring **MILTON BERLE** on television every Tuesday night. **METROPOLITAN OPERA** radio broadcasts every Saturday afternoon.

TEXACO

TEXACO

FOR LOWER COSTS . . .



TRY the "hammer test" with ordinary grease. Stand back and hit it! Note how it splatters, fails to hold together — proof that ordinary grease soon pounds out of chassis parts, leaves them unprotected, shortens their life. Fleet owners everywhere agree that *Texaco Marfak* gives the best protection under all conditions.

*Oil X***. Fully detergent and dispersive, this oil keeps engines clean, assures full power, less fuel consumption, lower maintenance costs.

Protect crawler track mechanisms with *Texaco Track Roll Lubricant*. It guards against moisture, dirt and wear under all operating conditions.

Let a Texaco Lubrication Engineer help you simplify your maintenance lubrication . . . keep your equipment on the job and out of the repair shop. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

MORE THAN 400 MILLION POUNDS OF MARFAK HAVE BEEN SOLD!

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Faithfully yours 50 TEXACO *for Fifty Years*

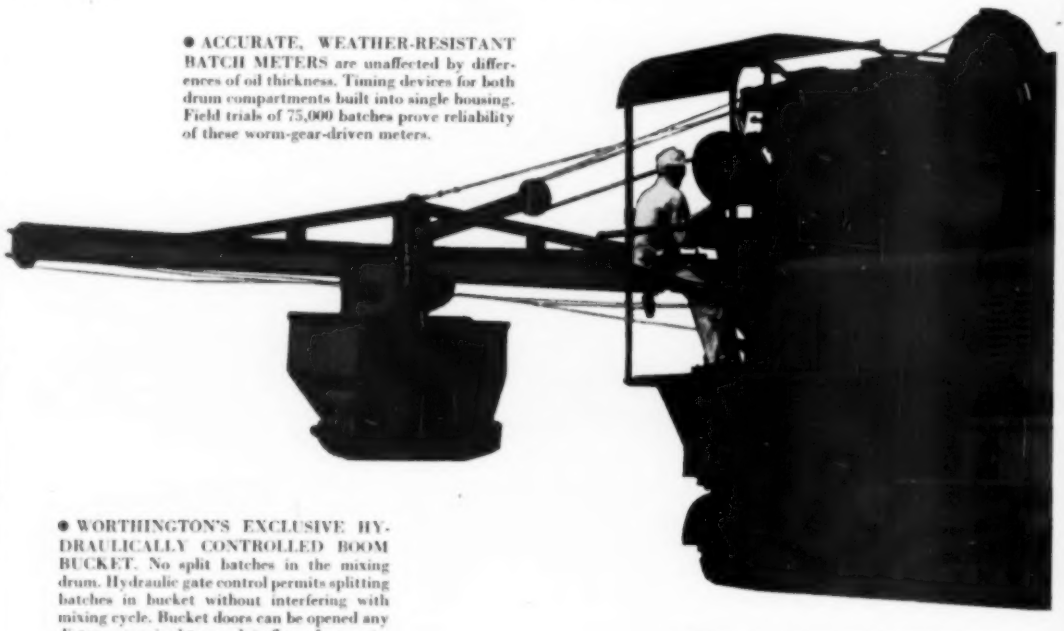
NEW! WORTHINGTON—built to help you

It had to be built! Today's tight schedules and rigid specifications demand a new, better paver that can do a high-speed job without sacrifice in quality.

And it had to be built by Worthington-Ransome! It took 40 years of Worthington-Ransome paver experience and the unmatched facilities of their integrated engineering staff to make possible this new paver.

● INSTANT, POSITIVE RESPONSE WITH SMOOTH, EFFORTLESS CONTROL. Transfer and discharge chutes, water valves, boom swing, bucket travel and controllable bucket discharge, all easily operated with hydraulic control levers conveniently placed for rapid action.

● ACCURATE, WEATHER-RESISTANT BATCH METERS are unaffected by differences of oil thickness. Timing devices for both drum compartments built into single housing. Field trials of 75,000 batches prove reliability of these worm-gear-driven meters.



● WORTHINGTON'S EXCLUSIVE HYDRAULICALLY CONTROLLED BOOM BUCKET. No split batches in the mixing drum. Hydraulic gate control permits splitting batches in bucket without interfering with mixing cycle. Bucket doors can be opened any distance required to regulate flow of concrete. Concrete can be spread across runways up to 25 ft wide while paver operates outside forms.

● RUGGED, RESPONSIVE BOOM-SWING MECHANISM. Mechanism is hydraulically controlled, piston operated, bull-wheel type. Hydraulic cushioning prevents bent booms. No worm gears to break.

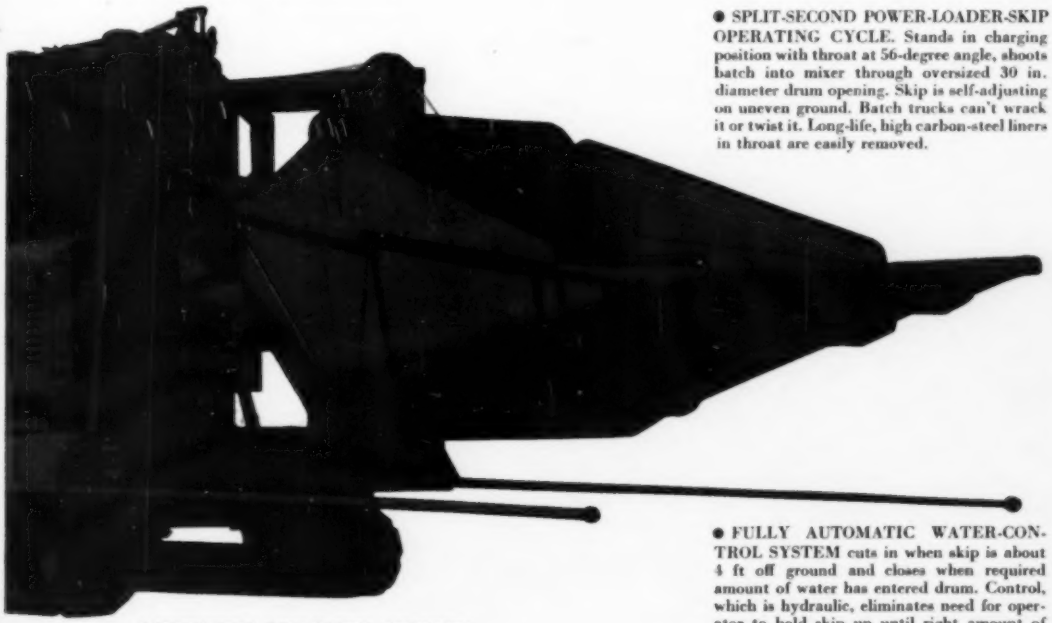
● FAST, POSITIVE BOOM RAISING AND LOWERING. Worm-drive mechanism fully enclosed and running in oil; operates only when booming up and booming down.

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

RANSOME PAVER
set paving records

Check these features of this newest paver and see for yourself.

- Power loader skip takes only 6½ seconds from ground to discharge position of 56° on low slope
- Transfer from first compartment to second compartment approximately 6½ seconds, depending upon concrete consistency
- Discharge into boom bucket approximately 6½ seconds, depending on concrete consistency
- Boom bucket travel speed—256 ft per minute
- Hydraulically-controlled boom swing of 171°
- Can swing and spread simultaneously



● SPLIT-SECOND POWER-LOADER-SKIP OPERATING CYCLE. Stands in charging position with throat at 56-degree angle, shoots batch into mixer through oversized 30 in. diameter drum opening. Skip is self-adjusting on uneven ground. Batch trucks can't wrack it or twist it. Long-life, high carbon-steel liners in throat are easily removed.

● FULLY AUTOMATIC WATER-CONTROL SYSTEM cuts in when skip is about 4 ft off ground and closes when required amount of water has entered drum. Control, which is hydraulic, eliminates need for operator to hold skip up until right amount of water is discharged by using an adjustable automatic water cut-off delaying action.

● EFFICIENT, LOW-SPEED, OVERSIZE DIESEL. Cummins HBID-600. Engine speed only 1300 RPM. Experience has shown that this kind of power unit performs better, lasts longer, and costs less to run. Main power take-off speed-reduction unit has cut tooth, helical gears; sealed, self-aligning anti-friction bearings. Sealed, triple-width roller-chain coupling between speed-reduction unit and countershaft.

Get the complete story of this new Worthington-Ransome WP Paver through your Worthington Blue Brute Distributor or by writing direct to Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, N. J.

WORTHINGTON

DISTRIBUTORS IN ALL PRINCIPAL CITIES

R1.3

Keep 'em Working
in the big year coming up

MOVES MORE PAYDIRT PER DAY! That's International's Big Red TD-24—the most powerful crawler on the market—the crawler that gives you the fastest work cycle.

Here's help... where and when you need it... with your International Industrial Distributor's ready service and parts departments

Your crawler tractors have to pay off with more work done per day, more days worked per year.

That means speed and power. The ability to stay on the job. Minimum downtime.

And it also means fast maintenance service at your call, when and where you need it.

That's your International Industrial Distributor's service—service that includes

TRAINED "DIESEL DOCTORS"—factory-trained specialists in maintenance and overhaul.

PROMPT FIELD SERVICE at your job site to help keep your equipment working, to get it back to work faster, to cut costly downtime on the spot.

COMPLETE SHOP FACILITIES for major work—you're never far from an International Distributor's shop, no matter where your equipment goes.

QUICK PARTS SUPPLY from your distributor's fully stocked parts department, backed by International Harvester's network of strategically located parts depots (in size and scope, exclusive in the industry).

Isn't this *complete* service a mighty good reason to get International *"Power that Pays"* for the hard-working years ahead?

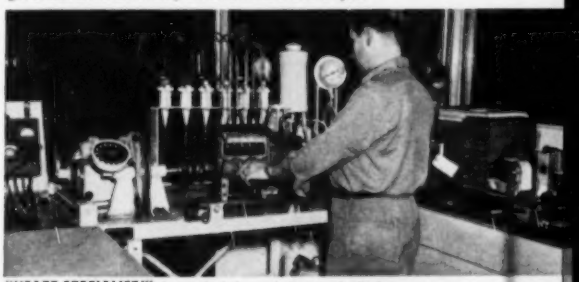
INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS

YOU NAME IT—your International Industrial Distributor has it in his big, efficient parts department. And if he hasn't, he can get it fast from his nearby International Parts Depot.



"HEART SPECIALIST!" A crawler's heart is its sturdy fuel pump. It seldom needs attention. When it does, this "diesel doctor" operates with precision instruments in a special dust-free room.

HERE'S HELP WHEN YOU NEED IT. Skilled, experienced mechanics equipped with the right tools for doing major maintenance fast at your International Distributor's shop.

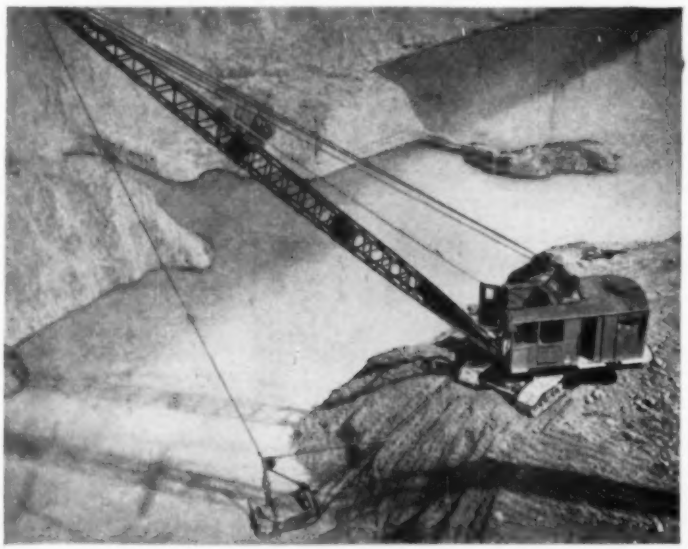
ON THE JOB. Here are an International Distributor's field servicemen, on the job at the job site installing an overhauled transmission. A phone call gets this kind of service.

WIRE ROPE

You'll save time and cut costs with ROEBLING rope

FAST OPERATION AND DOLLAR SAVINGS are more important than ever in excavating and construction. One sure way to save time and expense is to specify Roebling Preformed "Blue Center" Steel Wire Rope. Here's a tough rope that stands up under shocks, strains and high speeds. Its preforming always assures maximum handling ease, better spooling and much smoother performance on the job.

Roebling makes a full line of wire rope. Have your Roebling Field Man recommend the *right* ropes for your equipment. And for longest life, get his advice on the correct use and maintenance of wire rope. It is based on experience with thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.



ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices . . . have the full strength of the rope. Send for the full story.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

THINGS MOVE FASTER when a "QUICK-WAY" is on the Job!

Reg. U. S. Pat. Off.

FASTER TO and FROM the JOB • 50 M.P.H. on the Highway

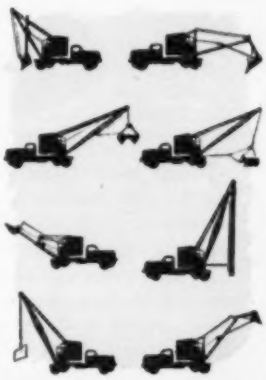
MORE WORK FINISHED ON THE JOB FASTER

You Make PROFITS FASTER

Job Tickets tell the story... *more hours of work each day... more work per hour... lower operating costs... lower maintenance costs*... it all adds up to *bigger profits for you.*

Yes, *QUICK-WAYS make faster profits*—give you fast truck speed between jobs—eight money making attachments—fast working speeds—4 models from 3 to 10 ton crane capacity.

—and quality construction too—all steel for strength and lightness—accurate balance—high capacity to weight ratio. More parts are interchangeable and easy to get at, which simplifies maintenance and repairs. All parts deliver their capacity rating and more. This fine construction means longer life—more profits on a small investment. They're economical to buy. Ask your distributor for a free demonstration.



Mail Coupon Today!

"QUICK-WAY" TRUCK SHOVEL CO.

DENVER, COLORADO
U. S. A.

"QUICK-WAY" TRUCK SHOVEL CO.
Dept. 38—2400 East 40th Ave.,
Denver, Colorado

Please send me complete details on "QUICK-WAY" truck shovels—four different models for large jobs and small.

NAME_____

ADDRESS_____

CITY_____ STATE_____

The Gradall works easily in many a tight spot!

WHEN YOUR CONSTRUCTION WORK must be done in "tight" places such as this, there's one machine you can count on to do the job quickly—the Gradall.

Its "arm-action" boom actually reaches out, twists and turns, to do its work in areas very little larger than the machine itself. And the Gradall's powerful hydraulic "down pressure" and exacting tool control make it easy to dig excavations to blueprint specifications—with clean-cut vertical or sloping sides, precise square corners, and perfectly graded floors. It practically eliminates costly hand labor.

But take your own construction problems to your nearest Gradall Distributor. He'll be glad to show you how this versatile machine can cut costs for you, too.

Gradall—the multi-purpose construction machine *with controlled down pressure*

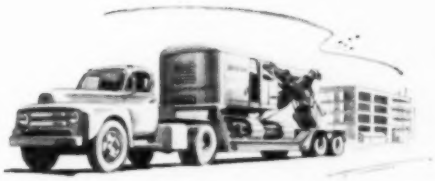
Gradall®
DIVISION OF WARNER & SWASEY Cleveland

Gradall Distributors in over 60 principal cities in the United States and Canada

the RIGHT gear ratio for load, road, and type of service

means more and faster trips, lower cost, longer truck life

EATON 2-Speed Axles *double* the conventional number of gear ratios, giving drivers a *right* ratio for every operating condition—on the highway, or off, starting out under full load, climbing grades, highballing, quick shifting in traffic. Engines run in the most efficient and economical speed range, reducing stress and wear on engines and power transmitting parts; adding thousands of miles to vehicle life. And Eaton Axles last longer because exclusive planetary gearing better distributes gear tooth loads. The exclusive Eaton forced-feed oiling system provides positive lubrication at all vehicle speeds. Ask your dealer to show you how Eaton 2-Speeds will help *your* trucks haul more, faster, longer, at lower cost!

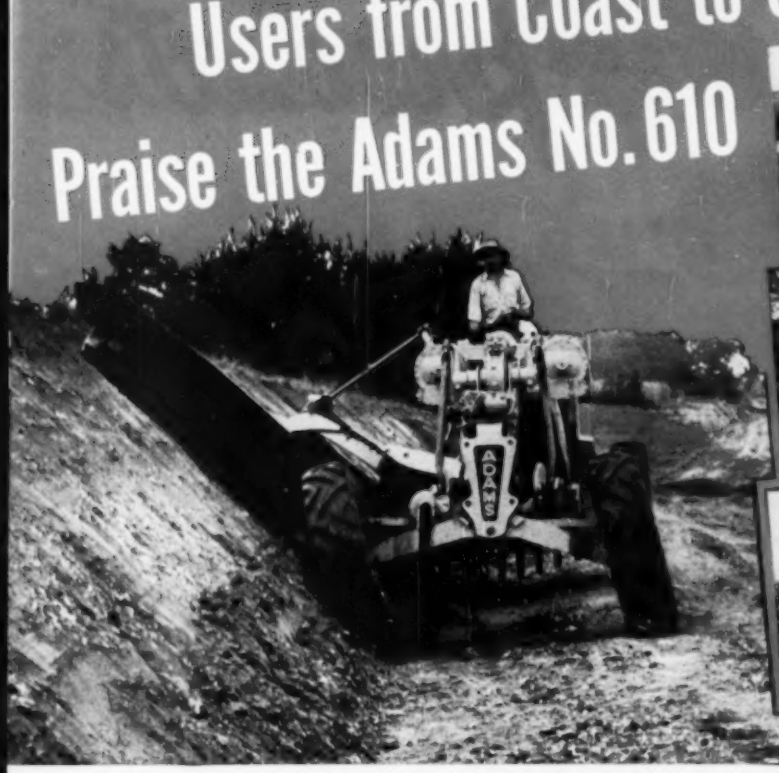


EATON 2-Speed Truck AXLES

Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Users from Coast to Coast Praise the Adams No. 610



King of all Motor Graders for Rugged, Heavy-Duty Work

Wherever you go, you'll find the husky, 100 hp. Adams No. 610 hard at work on the roughest, toughest grading operations.

Pictured above are just a few of the many jobs that the No. 610 handles easily, economically . . . high bank sloping—material spreading and maintenance of haul roads on dam projects—precision subgrading for new highways—blending and spreading heavy road mix.

For users who do not need such brute strength and power, Adams builds a complete line of medium- and standard-duty motor graders—a machine with the right power and right capacity for every grading requirement.

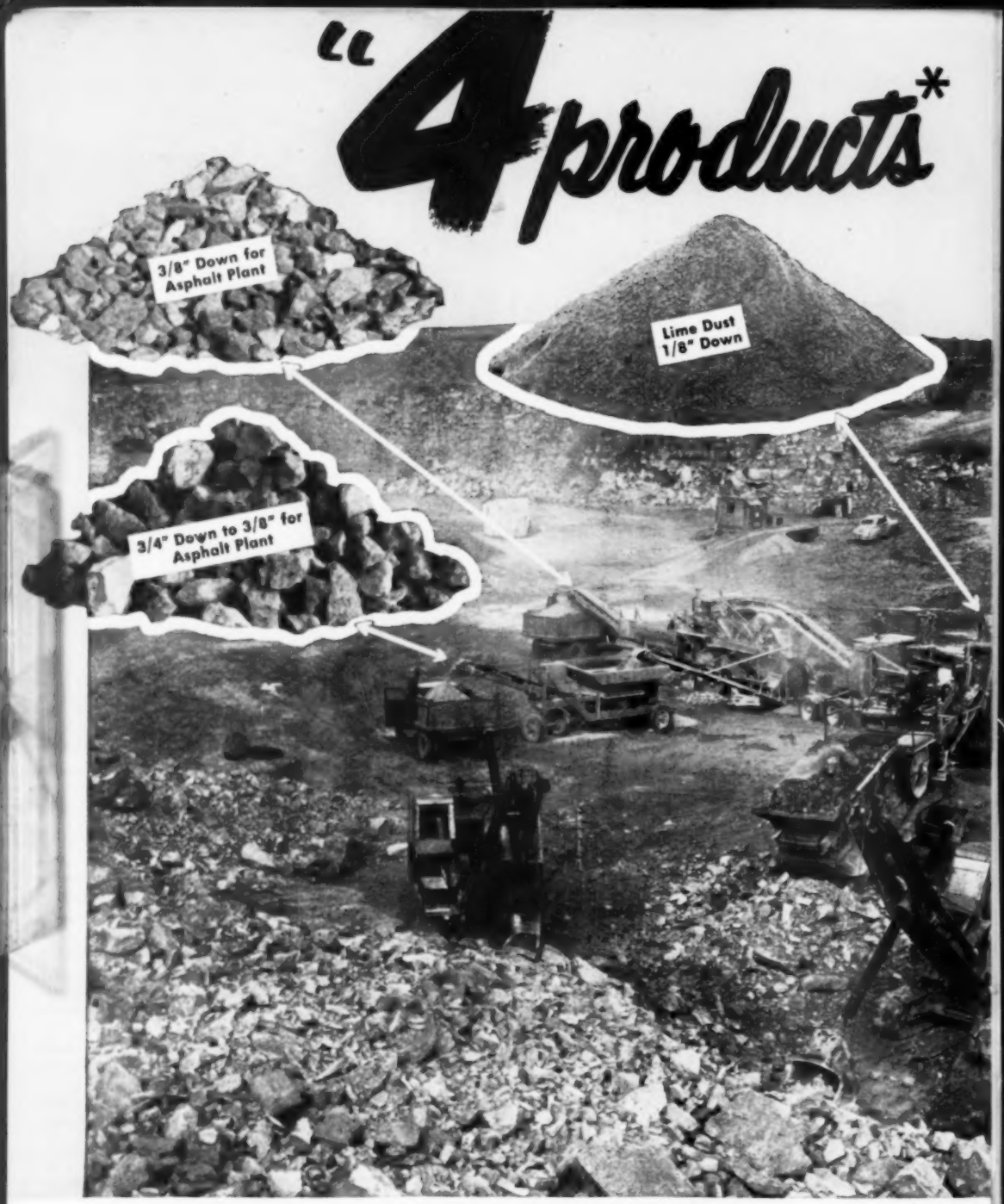
Ask your local dealer to show you how and why Adams Motor Graders are always your best buy.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

Only Adams has this exclusive combination of advantages

- **8 Overlapping Forward Speeds**...Flexible working range speeds work—increases output—provides high transport speeds.
- **Wide Range of Blade Positions**—Without Mechanical Adjustments . . . Saves Time in Adapting Machine to Needed Cuts.
- **Positive-Action Mechanical Controls** . . . Dependable, accurate adjustments—because they're geared . . . Easy, natural steering.
- **Ample Operating Clearances**...Quick, easy adaptation to work . . . Operator comfort, convenience, efficiency.
- **Fast, Easy, Servicing Plus World-Wide Dealer Service** . . . Saves time and money.

Make your next motor grader an **ADAMS**



THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

at a time and 210 TONS PER HOUR

from one of my UNITIZED PLANTS!

That's why I buy CEDARAPIDS"

Says B. L. Anderson
Cedar Rapids, Iowa

*Lime dust from 1/8" down, *3/4" Class A Road Rock for county roads, *3/8" minus and *3/8" to 3/4" aggregate for black top... that's what B. L. Anderson's Unitized Plant is producing *in one operation,* at a rate of 210 tons per hour!

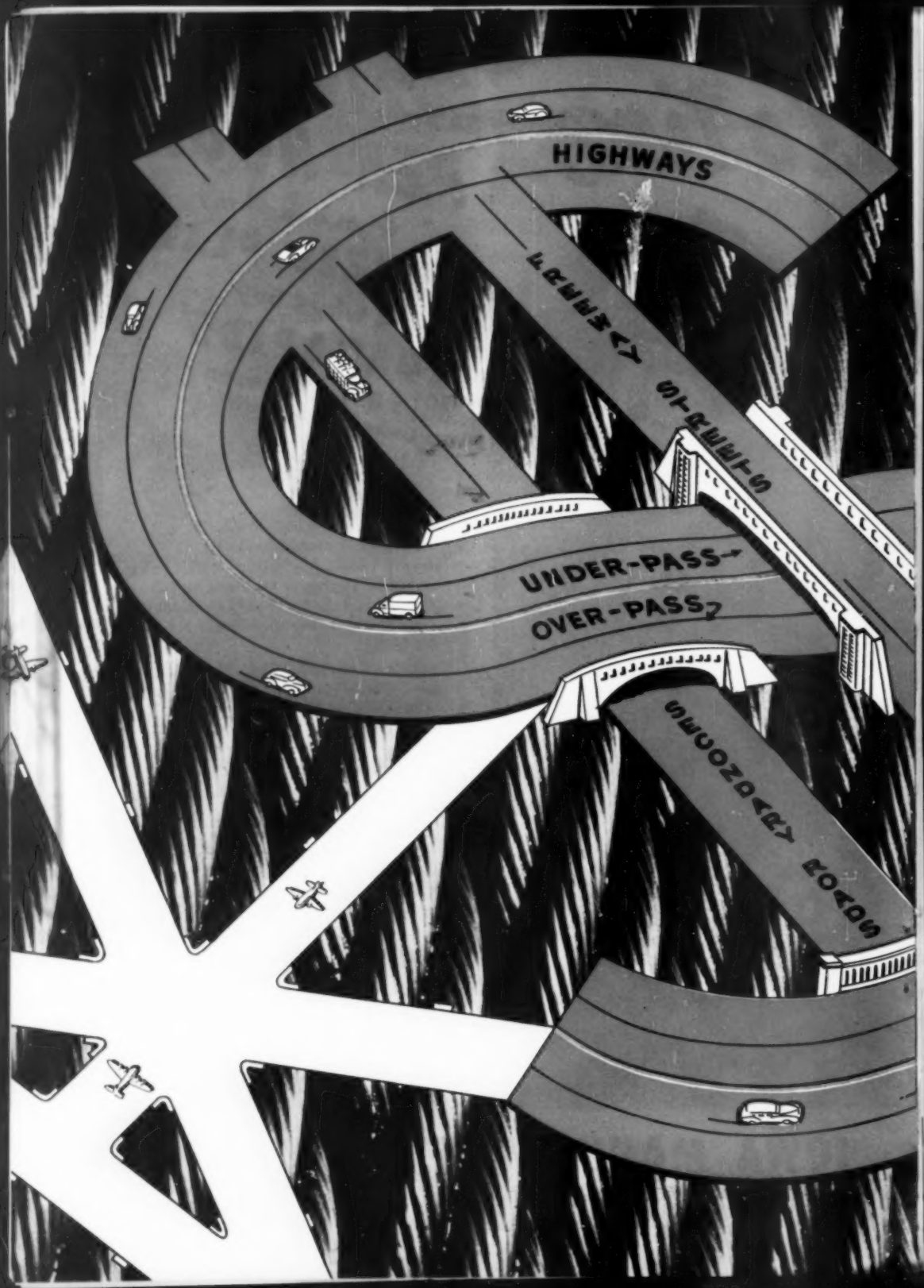
And that's not all! When Mr. Anderson wants to meet specifications for other jobs, the basic units of his Unitized Plant can be combined in any way to produce any size products in volumes up to 250 tons per hour, with real economy in operating costs and maintenance.

Mr. Anderson's Unitized Plant illustrated here consists of a 2236 Primary Unit, a Screening Unit with 4' x 12' Horizontal Screen, a 4033 Hammermill Secondary and four Portable Bins. The rock crushed for black top is being mixed in a Cedarapids Model ECW Asphalt Plant operating at the same location. B. L. Anderson also has two other quarry operations each using 2236 Portable Primaries and 4033 Hammermill Secondaries.

More and more contractors are insisting on the advantages of Cedarapids equipment... single units or complete portable plants... to meet today's stepped-up demands for low-cost aggregate and black top. Your Cedarapids distributor can give you *all* the reasons why... ask him for full details.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.


HIGHWAYS
UNDER-PASS
OVER-PASS

GOOD ROADS ARE CHEAP!

Figured on a per year instead of a per mile basis, good roads will cost nothing because they will pay off in miles, minutes and lives. Time and delay studies show that lost minutes at 1 cent per minute, per car and lost miles at 3 cents per mile, per car will more than pay the yearly cost of modern highways tailored to fit traffic flow and load. Facts from the Public Roads Administration's accurate inventory of highways and traffic indicate that –

AMERICA CANNOT AFFORD TO WAIT UNTIL THERE ARE 100 CENTS IN THE DOLLAR NOR UNTIL THERE IS UNEMPLOYMENT TO BE RELIEVED

This is a REPRINT of one of a series of Advertisements
PUBLISHED IN 1947 in the interest of
Better Roads for Better Living

The road building problem is even more acute than it was then. In 1947, there were *37,327,661* motor vehicles. The highway planners were thinking in terms of highways to accommodate 46 million vehicles by 1970. Today nearly 50 million motor vehicles are jam-packing highways which become obsolete faster than new ones are built. It is a case where too *small* planning has led us into a *big* dilemma. It points up the fact again that all America should —

THINK BIG

— today about tomorrows highways, streets and bridges. *Big Plans* need to be made now. It must be made obvious to all that unless we are prepared to tackle an enormous road building job at the earliest possible moment, then our efficiency for defense and for peace will be tremendously handicapped by a road system which really is adequate only for the volume of traffic existing in the early 1930's.

An all-out total effort is needed to enlighten the public and arouse responsible officials and legislators to *think big* — apply plenty of *mind-power* if we are to lick this problem before it paralyzes our mobility of transport.

Anything that you can do, no matter how limited, contributes just that much to the total effort — and from the selfish standpoint, the welfare of your own affairs.

UNION WIRE ROPE CORPORATION
2200 Manchester Ave. Kansas City 3, Mo.

union Wire Rope
union-formed is Preformed

HYSTER... One of the Oldest Names in Tractor Equipment*

33 Hyster Tractor Tools

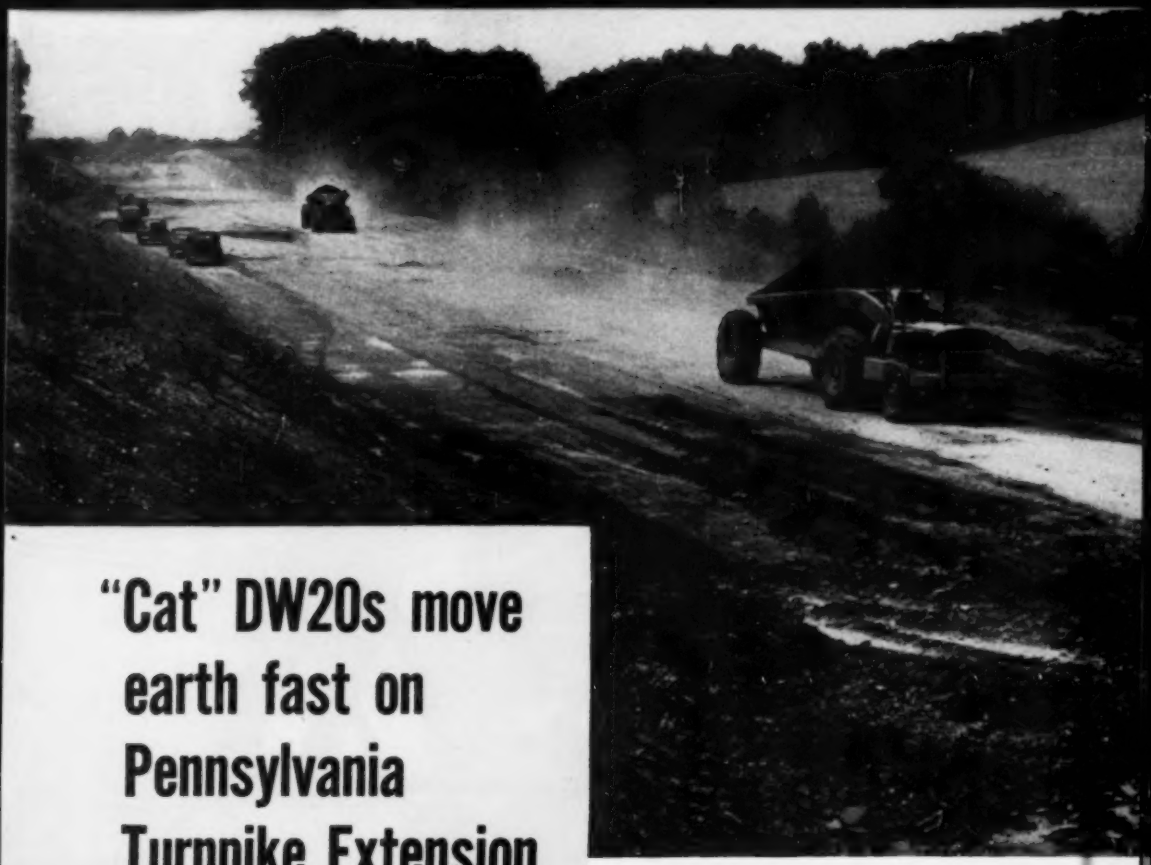
...include a complete line of WINCHES, YARDERS, TRACTOR DONKEYS®, CRANES, the LOGGING SULKY® and ARCHES; GRID ROLLERS for bituminous road salvage; and HYSTAWAY®, the 5 in 1 tool that includes dragline, clamshell, crane, shovel and backhoe.

Hyster Tractor Tools make money for their owners in construction, logging, oil fields, road work, and in many branches of general industry and the government.

For 22 years Hyster has made tractor tools for use with Caterpillar track-type tractors. Mounted on the big yellow machines, dependable Hyster tractor tools are at work on the roughest, toughest jobs all over the world.

Hyster tractor tools are sold and serviced by more than 700 Caterpillar-Hyster dealer stores around the globe.

***MORE THAN 40,000 SATISFIED OWNERS OF HYSTER TRACTOR WINCHES**



"Cat" DW20s move earth fast on Pennsylvania Turnpike Extension

Two of L. G. DeFelice & Son's "Cat" DW20s and W20 Wagons roll to the fill at 25 mph. with 20-yard loads. This $7,000,000 contract calls for moving 500,000 yards of earth.

L. G. DeFelice & Son, contractors on a 16-mile stretch of the western turnpike extension between Warrendale and Homewood, Pa., use eight "Caterpillar" DW20 Tractors and W20 Wagons for long-haul earthmoving. Handling 20 to 23 pay yards at a load, and making 2½ round trips per hour over a 1¼-mile haul route, the "big rigs" are operating 12 hours a day. That means the eight machines are hitting a daily average of close to 5,000 yards.

DeFelice's master mechanic likes the trouble-free operation of these husky wheel tractors. They outwork competitive equipment. And the fact that they're completely "Caterpillar"-built, including the engines, makes it easy to maintain and service them right along with the four D8s, six No. 12 Motor Graders and three No. 80 Scrapers that round out the "Caterpillar" fleet.

Wherever long, fast hauls call for wheels, the DW20 is making a reputation for big production and over-all economy. Owners who value such equipment take extra-good care of it these days. Proper maintenance will add to its long work life, and regular inspection by the "Caterpillar" service man will prevent down-time for repairs.

Your "Caterpillar" Dealer is the best friend your machines have. Make the most of all he has to offer.

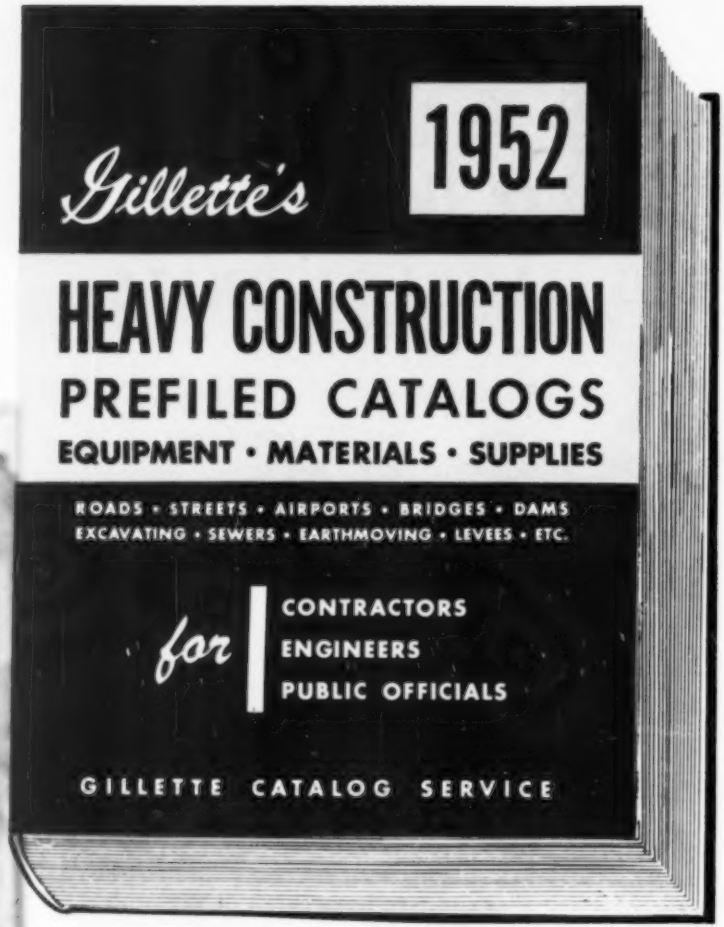
CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT


NEW
MARION
1911
WESTERN
CONTRACTING
CORPORATION
GET THE DETAILS FROM



It's in

Your most useful Source of Buying Information

Keep it handy
Use it often

When you are in the market for new construction equipment, materials or supplies, turn to Gillette's Heavy Construction Prefiled Catalogs for information on what to buy and from whom. Here's the swift, economical and satisfying way to make your pre-purchase studies. In this single volume America's leading manufacturers of these products have placed their catalogs, many of them specially designed for your convenience—"boiled down" to save you time and energy.

This book saves you cabinet and floor space and the secretarial time that would otherwise be spent in classifying and filing individual manufacturers' catalogs.

It saves you, too, the time and trouble of writing to manufacturers for the information you need. Here are enough facts to enable you to study the product that interests you and to decide whether to call your local dealer or distributor for decisive action.

When you want information quickly, on a certain class of products or on the product of a specific manufacturer, turn first to the index for the name or trade name of the product in which you are interested and then to the manufacturers' catalogs which are arranged in alphabetical order by manufacturers' names.

your office... use it often

Probably you have already used this book. Certainly you will have many more occasions to turn to it for help. Your associates, too, can make equally good use of it. Why not make it available to them, also?

Get the prefiled catalog habit and conserve your time, temper and energy. Whenever you think of construction equipment, materials or supplies, consult this book's informative pages for the kind of buying information you want.

If you don't find in it just what you want, write us suggesting the names of other manufacturers whose products you would like to see cataloged in the next edition. Help us give you the most complete, dependable and convenient source of buying information available anywhere.

Please use the coupon below for your comments.

GILLETTE'S HEAVY CONSTRUCTION PREFILED CATALOGS • 22 W. MAPLE ST., • CHICAGO 10

YOUR COMMENTS

please

If you have already made use of this book, or have suggestions for its improvement to help you better, please fill in the form at the right and mail it to the publisher. Your co-operation in this way can be of great help to him in making this book what you and he want it to be—a convenient, complete, accurate and useful source of information designed to meet your needs.

Gillette's Heavy Construction Prefiled Catalogs
22 West Maple Street, Chicago 10, Illinois

Gentlemen:

☐ I have a copy of the 1952 edition of this book.

☐ I do not have a copy but want one.

☐ I have already used my copy for looking up information on these products

.....

.....

In the next edition I would like to see the catalogs of the following manufacturers:

.....

.....

My Name ..... My Title .....

My Company or Department Name .....

Street Address .....

City ..... Zone ..... State .....

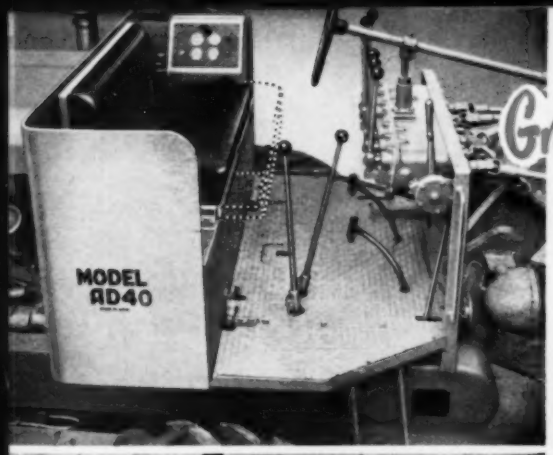
NOW! a Great New HEAVY-DUTY GRADER

Allis-Chalmers AD-40

Weight — 23,000 lb.
(24,800 lb. with optional calcium chloride in tires)

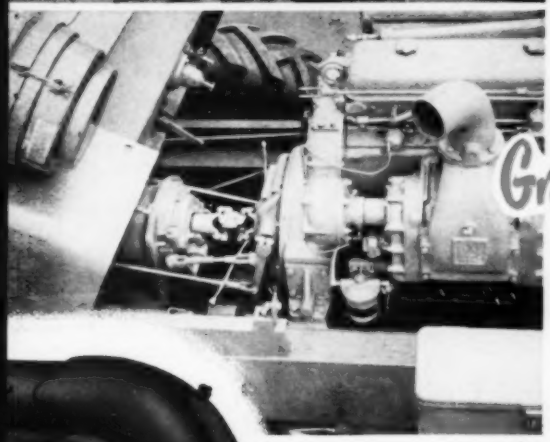
104 Brake hp.

Built to handle All Jobs — FASTER, EASIER



Great New operating ease

No other grader has been designed with the operator more in mind. **Unmatched Visibility**—Single tubular frame from front to platform, new lift cases, low control box and tapered platform give operator a full view of what he is doing. **Feather-Touch Steering**—New hydraulic booster system, fully enclosed in the frame, provides effortless steering with positive control even under toughest conditions. **All-Around Comfort**—Roomy platform, adjustable seat (as shown) and simple controls offer any size operator true comfort—sitting or standing.



Great New service simplicity

Here's maintenance and repair accessibility second to none. Combined fuel tank and seat unit tilts forward for easy access to clutch, transmission and drive shaft. Transmission can be removed without disturbing floor plates. Power take-off and hydraulic pump are mounted outside the dash.

Great New performance

Add these outstanding operator and service advantages to the exclusive Allis-Chalmers features that include ROLL-AWAY* Moldboard—extra high clearances from front to rear—shock-absorbing tubular frame—dependable General Motors 2-Cycle diesel power . . . and you have the finest heavy-duty grader on the market. Get the full story on this new AD-40 from your Allis-Chalmers dealer now.

*ROLL-AWAY is an Allis-Chalmers Trade-mark.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

• Designed for Your Job • Built to Take It • Easy to Operate • Easy to Service

Harrison County backfills and grades with aid of TOURNADOZER

Rubber-tired D Tournadozer stockpiles sand behind seawall for jetting.

When Harrison County, Mississippi, needed a dozer to work in ocean blow sand, they arranged for a demonstration of a LeTourneau Tournadozer to check the reported outstanding advantages of this new, high-speed, rubber-tired dozer on sand operations. After seeing the machine work the County Board of Supervisors agreed whole-heartedly with the recommendation of County Engineer Arthur MacArthur and authorized purchase of this versatile, modern machine.

One of its first assignments was to move in material for renewing washed-out back-fill and foundation material under a section of the 24-mile seawall between Pass Christian and Biloxi. This work was a preliminary to the placement of approximately 4,000,000 cu. yds. of sand fill which is being pumped hydraulically from the Gulf to form a 300′ wide sand beach.

Tournadozer backfills walls, levels beach

Tournadozer picked up blow sand (similar to Michigan dune sand) lying between Highway 90 and the seawall and dozed it against the wall, from where it was jetted under the wall foundation. Where available, additional sand was dozed in to complete the back-fill. Where insufficient material was available on the land side of the seawall, a dragline will be used to excavate sand pumped in on the beach side and cast over behind the wall for jetting. Later, the Tournadozer will level off the 300′ wide beach behind the hydraulic operation to a 2% grade from seawall to water line. The entire area between wall and road will also be "dressed" with Dozer for appearance and surface will be leveled to reduce drifting from wind and wave action.

Speed and flotation beats blow sand

Since the beach sand in this area has underlying quicksand in some spots which will not carry the weight of as heavy a machine as the Tournadozer, unit is equipped with a rear-end winch. It is surprising how well the machine handles in the new fills of soft blow sand, and the high-speed operation enables it to travel right through some of the worst soft spots. Occasionally, however, the winch comes in handy to pull out where advantages of high speed plus flotation of the big, soft tires are not enough to keep the machine rolling through larger quicksand areas.

"Can hardly believe it," says County Engineer

Engineer MacArthur, Harrison County, enthusiastically says, "I can hardly believe this is tough sugar sand

LETOURNEAU LET EQUIPMENT

R. G. LeTOURNEAU, INC.

PEORIA, ILLINOIS

24 miles of tough blow sand

Note flotation of large tires over freshly dozed blow sand.

we're working in after seeing the Tournadozer perform in it." Construction men who have worked the light sand areas of the gulf beaches will appreciate MacArthur's enthusiasm.

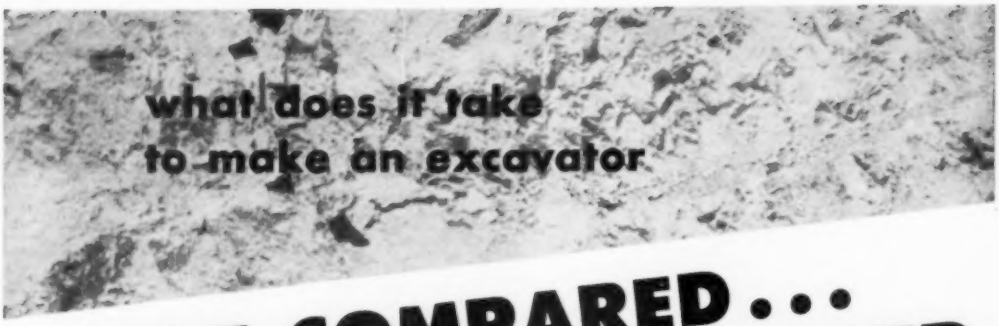
Travels 20 miles a day doing odd job maintenance

When Tournadozer gets ahead of the jetting operations, the versatile one-man dirtmover heads out for other assignments, frequently traveling 20 miles a day throughout the county to take care of odd-job maintenance. It has knocked down trees, stacked brush, cut down clay hills for bridge approaches, and handled many a small-volume earthmoving job.

Save taxpayer money and speed service

You, too, can save taxpayer's money on more jobs done with less equipment, less manpower, less travel time, and less time lost synchronizing men and equipment for small scattered jobs. The "go-anywhere" Tournadozer will speed "do-it-now" calls by eliminating truck and trailer hauling, loading, and blocking. It gets there faster, does the job faster, gets to the next assignment faster. See your LeTourneau Distributor for job-proved facts.

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT



MOST COMPARED . . . MOST PREFERRED

The record shows there's one line of excavators that owners, operators and maintenance men use most as a standard of comparison . . . one line they prefer most. That's Bucyrus-Erie, and here are a few of the reasons why:

SIZE AND STRENGTH TO MATCH THE JOB. Seven different Bucyrus-Erie excavators are included in the ⅜- to 4-yard range of gas, diesel and single-motor electric machines. Each is designed as an entirely separate model. Materials and construction are specified for best results in each size. Complete facilities permit use of either welded or cast steel, plus special heat treatment, to meet design requirements and to provide extra long life.

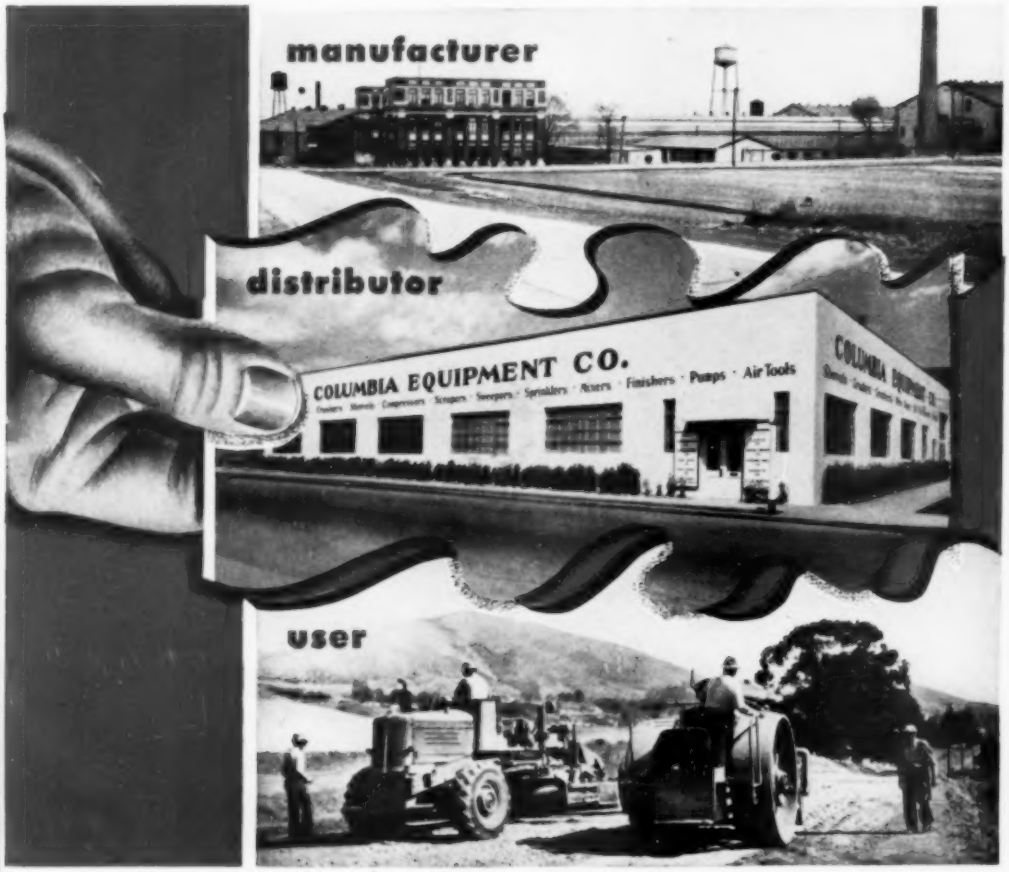
PROVEN PERFORMANCE. Bucyrus-Erie design balance ties in all the phases of the operating cycle smoothly and efficiently for maximum output. Examples of this performance: yardage wise owners have bought more 10-B's than any other ⅜ yd. excavator; more Bucyrus-Eries for rock than any other make.

SERVICE — WHERE AND HOW YOU WANT IT. There are 63 Bucyrus-Erie distributors throughout the nation . . . one of them near you. Featuring expert mechanics and genuine Bucyrus-Erie parts, they're your assurance of fast, dependable service.

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN



AN *Essential Part* OF THE PICTURE

It has been said that America has solved the problem of low-cost production of machines and goods, but that the problem of efficient, economical distribution remains largely unsolved. However true this may be in other fields, we sincerely believe that it is not true of the construction equipment industry, where the Distributor has enjoyed the confidence of his customers in times of peace, and has more than justified that confidence during troubled and uncertain periods when wars and "rumors of wars" bring about shortages of men and machines.

Your nearby Austin-Western distributor, with his skilled mechanics and adequate shop facilities, considers it his primary responsibility to help you get the utmost in service and satisfaction from the products he sells . . . is an especially good man to know in times like these.

AUSTIN-WESTERN COMPANY - *Subsidiary of Baldwin-Lima-Hamilton Corporation* - **AURORA, ILLINOIS, U. S. A.**

Austin Western

BLH

...ings are what count—dollars in the bank! That's what you buy a Shovel for—to make money! If it won't swing rock and dirt—if it's in trouble all the time—you're in trouble at the end of the contract.

Advertising can talk about superiority of design but repeat orders prove it!

Every Northwest advantage; the Northwest Independent Crowd, the "Feather-Touch" Clutch Control, Uniform Pressure Swing Clutches, the Cushion Clutch, Northwest Crawlers, Northwest Machinery Mounting—all have been engineered with operation for profit in mind. These are the things that have made one out of every three Northwests sold a repeat order. You can't have Northwest advantages without owning a Northwest.

NORTHWEST ENGINEERING COMPANY
1504 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

More Production... at LESS COST

EUCLID
THE PIONEER

PROVED on hundreds of off-the-highway construction and industrial jobs, and in open pit mines and quarries, "Eucs" have the capacity and speed to move more loads faster and at lower cost.

There is a Euclid model for every off-the-highway hauling requirement. Rear Dump "Eucs" of 10 to 34 ton capacity have travel speeds up to 36.3 m.p.h. and are powered by diesel engines of 125 to 400 h.p. Bottom-Dump Euclids range in capacity from 13 to 25 cu. yds., have top loaded speeds up to 34.4 m.p.h., and diesel engines of 190 to 300 h.p.

The Euclid Scraper has proved its dependability and efficiency on the construction of roads, levees, airports and in open pit mining. The Euclid Loader, teamed with the Euclid Bottom-Dump, has set records for low cost earth moving on a wide range of jobs.

You get more production at less cost with Euclids. Call your Euclid Distributor for help with your off-the-highway hauling problems, or write for information on the complete line of Euclid equipment.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

up to 25% more production

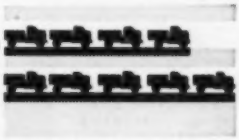
LINK-BELT SPEEDER with *Speed-o-Matic* controls

This Link-Belt Speeder LS-51 with trench hoe attachment is a real glutton for work. Full hydraulic Speed-o-Matic Controls produce faster cycles—make it easier on operators—increase production up to 25%.

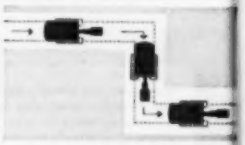
Speed-o-Matic full hydraulic controls mean stepped-up production

Speed-o-Matic Controls — fully hydraulic! You "feel" the load all the way. Simple, easy—fingers instead of muscles do work.

Eliminates up to 150 parts — cuts friction, no worn bushings, pins, links or clutch toggles to put you "down."



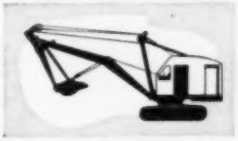
Up to 25% more production — fast operating cycle steps up output and profits. Effortless control keeps operator fatigue down.



Turns on a Dime. Either track can drive or be locked independently. Hydraulic control gives instant response.

Here are other LINK-BELT SPEEDER plus features that work for you

Convertibility — designed for peak production as shovel, crane, dragline or trench hoe. Convert in field—quickly, easily.



Gooseneck Trench Hoe — improved digging and dumping plus far less undercutting of the machine on deep cuts.

All Welded Construction — extra strength without extra weight. Resists impact and twist. Field service simple, fast.

Service — fast, efficient. Link-Belt Speeder Service is nationwide—near you with replacement parts, factory-trained mechanics.

LINK-BELT SPEEDER

CORPORATION

12,683

Builders of the most complete line of shovels, cranes and draglines

CEDAR RAPIDS, IOWA

MACK TRUCKS

Keep Pace...

WITH YOUR STEPPED-UP PRODUCTION

Today's conditions call for trucks that can keep pace with accelerated production schedules. More and more truck owners are realizing that trucks are really "Tools of production"... that intensified service makes doubly important the extra durability and sustained reliability they get from hard-working Macks.

Make sure *your* truck equipment measures up to the rigors of present-day demands. See your nearest Mack branch or distributor for the right truck for your particular job. Prove to your own satisfaction that "Built Like A Mack" means uninterrupted production... extra long life... more tonnage moved at lower cost for many years to come.

Mack TRUCKS

outlast them all

Mack Trucks, Empire State Building, New York 1, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

In punishing earth-moving service, hard-working Mack trucks have won enthusiastic owner acclaim because of their ability to "keep pace" with stepped-up demands. These diesel-powered Macks are part of a fleet serving Gull Contracting Co. of New York City.

ROADS AND STREETS

January, 1952 • Vol. 95 • No. 1

Mobile Flashers

HELP PAVING CONTRACTOR HANDLE HEAVY TRAFFIC THROUGH PROJECT

Contractor submitted traffic control scheme for O.K. as pay item on U. S. 40 Ohio project. 12,000 daily flow directed through job without serious mishap or delay.

USE of rubber-tired tripod-mounted flashers, designed for warning and directing traffic through a concrete paving job, proved successful on an Ohio contract this past season. The contractor was V. N. Holderman & Son, Inc., of Columbus. The project consisted of grading and paving 11.3 miles of new 2-lane westbound roadway on U. S. 40 west of Zanesville, as part of a progressive 4-laning of this heavily traveled highway. The closely paralleling old 2-lane pavement became the east-bound roadway on completion of the job, but during construction continued to carry traffic in both directions.

The critical period of traffic control occurred during the paving work, when part of the inner lane of the old pavement was blocked off for use by batch trucks and other contractor traffc.

The scheme used during paving operations included the following:

1. The beginning and end of the project were posted in a standard manner by "Road Under Construction" signs stationed on the shoulder for the project duration.

2. The near lane of the existing pavement was blocked off, as noted above, over a section beginning well ahead of the pavers and extending through the day's work. This lane, reserved for construction trucks, was separated from public traffic by dropping flag markers at about 50 ft. intervals. Contractor-built markers consisted of bits of red cloth fastened to twisted wire, in turn set in cement grout filled tin cans (see photo).

These markers, by the way, were inexpensive, and, in contrast with wood-base markers often used by highway maintenance crews to protect fresh striping paint, they resisted blowing over by wind or suction from passing vehicles.

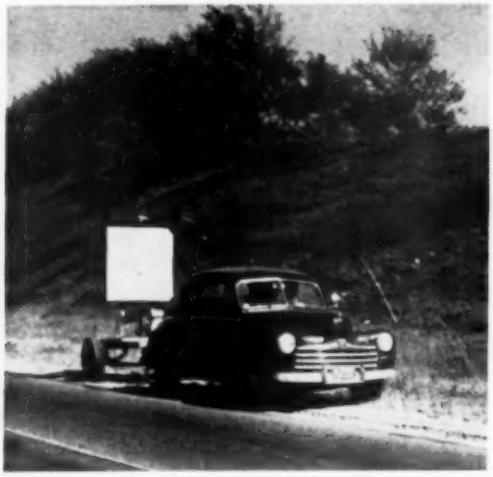
3. Two portable flasher units, reading "Traffic One Way Ahead," were built by the contractor, one for each end of the work zone. Each unit was operated by a small Kohler light plant with air-cooled motor, and included two amber lights which flashed alternately, giving a conspicuous day-time effect which warned oncoming motorists with no uncertainty. Designed as light tow-cart units, these flashers could be moved several times a day as needed to keep up with paving progress, by merely hitching them to the foreman's car or pick-up. The flashers were usually located about 2000 ft. in advance of the flagman.

4. A flag-control section was maintained adjacent to paving operations with a flagman posted at either end during working hours. At one flagman's post a large sign was stationed saying "Use Right Lane Only—No Passing." At the other end a corresponding sign read "Use Left Lane Only—No Passing." These signs, mounted on light wooden bases, were easily handled by two men and moved from point to point in a pick-up.

5. One or more additional flagmen were usually stationed at the pavers or other points where public traffic

★ Flasher designed and built by contractor, located about 2,000 ft. ahead of flagman.

★ Light plant for operating two amber flashing lights is mounted in weatherproof steel box



★ Flashing unit on the move to the next set-up, this move being made toward the end of the day

Some of the Traffic Control Details on Holderman's Job

★ After passing the flashing sign, warning of single-lane traffic, the motorist was stopped by flagman. Sign instructed driver in event flagman was not at post

★ Center line traffic guides made with concrete filled, steel tin cans. These guides were inexpensive, stable against overturning by air currents from passing vehicles

★ Overhead stop light at turn-off to concrete batch plant. Note temporary earth ramp and bridge over one of the new 12-ft. lanes

★ Light signal at batch plant was protected in both directions by warning signs. This double protection against traffic accidents considered essential

needed slowing, or other control, such as at batch truck turnaround points. Alternate one-way traffic through 1,000 to 4,000 ft. of roadway was handled expeditiously with the last driver carrying the flag through.

6. At the two batch plant locations along the project, overhead manually operated stop-and-go lights were installed to protect and expedite movement of batch trucks on and off the existing highway. Each of these lights was controlled from a small shelter, and each was supplemented by a conspicuous sign reading: "Traffic Light Ahead."

7. At night, normal two-way traffic was permitted, but with appropriate warnings including necessary flares along the work.

All contractor signs enumerated here included black lettering on white plywood or wood background. Signs were well constructed with strong framing around the panel, with repeated re-use on future jobs in mind.

An important detail in protecting traffic on the existing pavement was also observed during the grading. Wherever the median area was excavated or for other reasons the surface along the inner pavement edge was cut down, a prism of granular material was kept "banked" up against the slab. This protected against accidents that otherwise might have occurred when a car wheel edged off the pavement.

Fast Pace as Usual

This project was a "show" in other respects than for the thorough traffic control methods. As usual with Holderman jobs, the pace was fast.* After a late start last spring due to wet weather, the contractor finished all grading, fine grading, blanket course placement, concrete paving and median curb, and by late July had moved to another job. This project included 147,000 sq. yd. of 9 in. uniform depth reinforced concrete pavement. The company's tight schedule anticipated placing 440,000 sq. yd. of pavement on several jobs with the one outfit during 1951.

Holderman is said to have set a new state record on the U. S. 40 job, with a best day's run of 4293 lin. ft. of 9"x12' slab or 1036 batches using two 34-E dual drum pavers, two spreaders, two finishers and other

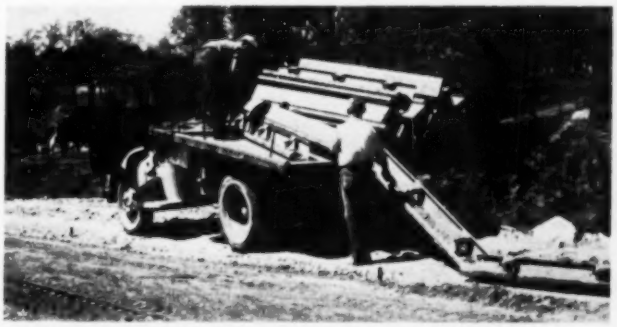
*"How Large Pennsylvania Road Job Was Completed 10 Months Ahead of Schedule"; Roads and Streets, May, 1951.

(Article text continued on page 48. See next two pages for additional step-by-step job photographs.)

Holderman's Methods—Step by Step

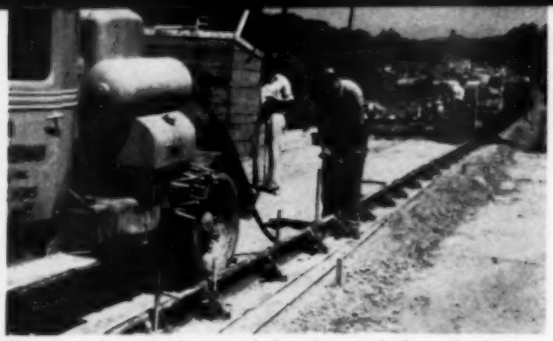
1. Special big-capacity windrowing spreader, equipped with adjustable wings, built for spreading granular subgrade blanket material. Drawn by old "50" Caterpillar tractor using two cables, threaded past truck on either side. Measured windrow here is 14 ft. wide (half subgrade). Ohio specification "S55" pervious dirt and gravel mixture used. Machine placed 160 to 180 8-yd. loads per day

2. Reinforcing wire mats were thrown off at carefully spotted locations, exactly alongside their final position. Labor and time saving. Man in foreground has tape anchored to forward corner of mat pile on truck from which next truck stop is spotted



3. Road forms were slid off truck, aided by driver who "pulled out from under" each rail section after two men had dropped one end to the ground

4. Fine grading began with passes with Austin-Western 99 grader, which also trenched ahead of the form grader (not shown)



5. Power form pin drivers used throughout. In background note Buckeye power subgrader, first machine on forms. Blaw-Knox forms used

6. A 5-ton Buffalo-Springfield roller worked immediately back of subgrader, followed by a roller-drawn screed for final planing

7. Item on this job was use of a "Franz E-Z" hand steered power roller of about 1-ton capacity for final subgrade compaction. Scratch template then followed

8. Each paver was supplied from a 1500-gal. tank trailer. Photo shows 1500-gal. booster truck (Ford) feeding tanker, via a 4-in. hose quickly coupled at point by cab door

9. 1500-gal. tank used behind one of the 34-E pavers. Has 8 tires on two axles, for good floatation in soft ground. Equipped with 4-in. Jaeger pump for quick filling, and 2-in. pump for supplying water to paver

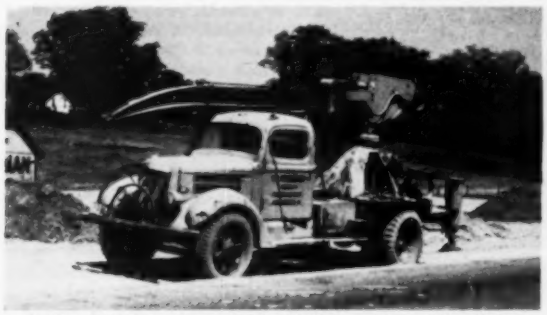
10. Two Koehring 34-E dual-drum pavers set the pace. Two Jaeger screw-type spreaders were used, one after each paver, the forward spreader striking off 3 in. below top of forms for placement of wire mats

11. Two Jaeger transverse oscillating screed finishers followed, the amount of concrete "roll" being carefully watched, with the roll in front of the second finisher kept near the vanishing point

12. Next came a Koehring longitudinal float finisher. Again, surface material moved was kept to a minimum by good management of finishing operation

13. Long handled floats, sparingly and skilfully used as necessary (foreground), were followed by long handled lutes (permitted here but not specified on Ohio paving). What is (or isn't) done here considered of prime importance in getting durable surface

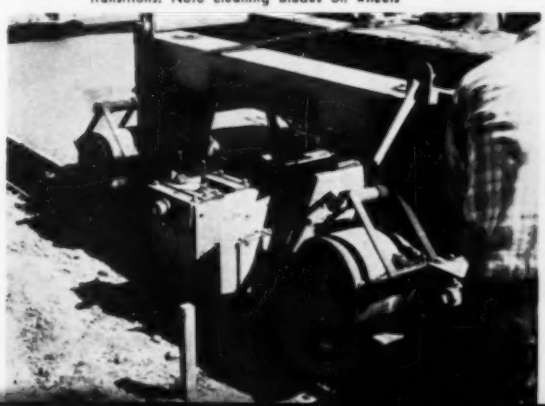
14. Burlap drags were kept in clear when not in use. Two used, saving carrying back and forth: head drag to obliterate straight-edge marks, second drag along edges to obliterate handwork



15. Following curing application (Heltzel machine, not shown), forms were pulled and loaded by army-surplus "cherry picker." Hydraulic cylinder on rear, presses on ground, offsets load reaction

16. At rear of job this "double duty" unit performs clean-up along slab, and tows power spray unit used for painting slab edge

17. To minimize derails, Holderman equipped all finishers and spreaders with special 15" to 24" wide, flat drum wheels on one side to permit the machines to be used on variable width transitions. Note cleaning blades on wheels



18. One of two complete batch plants set up to speed completion of the U. S. 40 job. Plants laid out for straight-line loading, with truck headed toward job

"Shocking" Engineer Shortage Spotlighted at SASHO Meeting

The importance of transportation in National Defense, the necessity of public support in planning and carrying out a highway program meeting today's needs, and the growing shortage of trained engineering personnel were among vital highway matters considered by the Southeastern Association of State Highway Officials at their tenth annual meeting held in Charleston, S.C., December 5-7.

The convention was attended by 570 delegates.

The Association elected 1952 officers as follows: president, Claude R. McMillan, chief highway commissioner, South Carolina; vice president, R. B. Richardson, director, Louisiana department of highways; secretary-treasurer, J. Kenneth Crowson, South Carolina highway department.

The association viewed with concern the "serious and critical need for obtaining and recruiting more trained engineering personnel to carry on the Highway Modernization and Replacement Program," and recommended better salaries, merit systems and retirement plans as inducements.

The association noted that state highway departments are not now in position to compete with industry and other sources of employment for graduate and trained engineers, and expressed the belief that these recommendations, if adopted, would "encourage graduate and trained engineers to make careers in highway department work."

Speaking on the shortage of engineers, L. S. Tuttle, assistant to the U. S. commissioner of public roads, said that the Engineering Manpower Commission of the Engineers' Joint Council, representing five leading engineering societies, recently made a study of the situation and came up with "some truly shocking figures."

The study showed, he said, that the present deficit of engineers is well over 60,000. The estimated annual need over the next ten years is 30,000. He added that the number of engineering graduates during this period will be far below this estimated annual need, and will not equal it before about 1965. It is obvious, however, that the next three years are going to be the lean years indeed, and that the next year, 1952, when only 12,000 graduates may be available for employment, will be particularly bad.

One of the basic reasons for the general shortage of engineers is the belated and still far from general recognition of engineering as a profession comparable to law and medicine, and the associated fact that engineering services receive less return than the other professions in the form of income and prestige, he said.

To correct the situation, the speaker appealed for a personnel policy which would provide the engineer an "adequate return throughout his professional life," and such inducements:

1. A personnel agency with adequate powers, staff and appropriations;
2. Admission to the service by proper competitive tests;
3. A probationary period preceding final appointment;
4. Probation based solely on merit and fitness;
5. In-service training;
6. A classification plan which places employes in proper groups and grades based on work performed, and with appropriate grade titles;
7. Salary schedules with minimum and maximum salary for each grade of the classification plan;
8. Service records to serve as a basis for advancement and promotion;
9. Reasonable security against unjust dismissal or demotion;
10. Good working conditions, uniform hours of work, vacation and sick leave privileges, and
11. A financially sound retirement system.

●

Turnouts. The Massachusetts Department of Public Works has had constructed throughout the State, turnouts on heavily traveled roads, particularly on 2-lane roads, in order to make available to trucks and passenger cars safe parking places for repairs or rest periods. These areas have been made quite elaborate and are capable of accommodating large trailer trucks.

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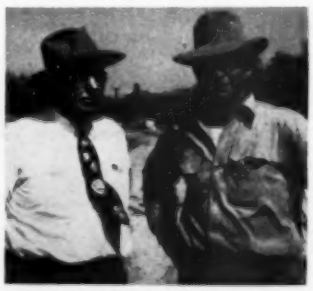
equipment here pictured. This record was eclipsed for a time by A. J. Baltes, Inc., on U. S. 25 in Woods County, Ohio, where 2400 lin. ft. of 24-ft. wide concrete was placed in a single-shift day. Then in September the Holderman crew won back their laurels on U. S. 33 in Franklin and Fairfield counties, setting another record of 5510 lin. ft. of 12-ft. wide slab in one 11½-hour day, (1327 batches, 11943 sacks of cement).

Pavement on the projects here mentioned were constructed with air entrained concrete. According to P. E. Masheter, assistant chief engineer, bureau of construction, Ohio state highway department, these jobs while built rapidly were finished with a high degree of evenness. On the project west of Zanesville the state's profilometer showed 13 variations from the specification surface tolerance of ⅛ in. in 10 ft. on the 11.4 miles of 24 ft. pavement. These relatively few variations were found in running the profilometer over the project in four parallel lines, including two in each 12-ft. traffic lane.

A. T. Connar was project engineer for the state on the U. S. 40 Zanesville-west project.

★ Holderman's outfit moves in fast, moves out fast, aided by a plan for loading everything on trailers. These tool, supply and office houses are designed to fit on company-owned trailer or truck beds



★ Vern N. Holderman, head of contracting firm, with Supt. George Yinger

EDITORIAL

Contractors Equipped to Give More for Highway Dollar

★ This striking pair of "Then vs. Now" pictures, published recently in the Chicago Tribune, were taken by the official photographer of the Illinois Division of Highways. As reported by Robert H. Tittle, Construction Engineer, one shows an elevating grader outfit, mule-powered, working on a road near Dwight, Illinois, in—Civil War days? No, in 1927. The other picture was snapped last fall on O'Connor Construction Company's grading project, U. S. 66, Sangamon County, Illinois.

The pair of contrasting photos shown on this page should provoke a bit of reflection on roadbuilding economics. Here is dramatized the fact that, in road building, better machines are compensating greatly for inflation. Despite the fact that the U.S. dollar has dwindled to less than half of its former buying power in the past quarter century, unit costs of building the greatly improved models of highways have been held down, relatively speaking. The public is benefitting, and this story should be told.

In an interview with Illinois highway engineers, Hal Foust of the Chicago Tribune spotlighted some interesting facts. "We pave today with only about one-third the expenditure of man-hours that were required under 1927 methods," this report stated. "Advances in economics have been hidden by a step up in specifications as well as by inflation. The cost per mile of road has tripled, but the amount of materials and energy going into a mile of slab [and roadway] has more than tripled. The pavement today is thicker, wider, stronger." And we might add, the entire road, when designed for arterial use, today is straighter and with fewer hills—as far advanced over the 1927 model as the cars and trucks that use it. The modern arterial highway could never have become a part of mid-century American life without the new machinery.

Construction engineer Robert Tittle of the Illinois division of highways explained in this newspaper account that the 1952 model highway, on the average, involved more than four times the earth moving per mile. Earth moving happens to be the field where the most spectacular advance in speed of construction, and lowering of costs, has taken place. Nine men with two scrapers and a tractor on the O'Connor project pictured here, moved and spread three times the material that could be handled in 1927 by an outfit of 40 mule teams and 90 laborers and skinners. Imagine the cost of finding 90 men and getting a good day's work out of them right now!

These facts are reviewed here for the attention of state legislative members who are serving on highway committees, as well as for busy engineers and contractors. All of us in roadbuilding are concerned with the complex problem of "making a case" for larger road programs. Despite the dislocated economy and emergency atmosphere of our nation today, road programs must be made to catch up with the rate that 8 million trucks and 44 million cars are wearing our roads out. We can all draw inspiration from that fact that the contractors with their machines are ready to give bargains in performance, despite seeming high unit bid prices.

This is one reason why, as the new year starts, the ROADS & STREETS editors would like to re-state the most basic of all highway facts: Its costs less to build good roads than to have poor roads. We as citizens and vehicle owners pay for good roads whether we have them or not. We are being gypped when our elected representatives at the state capitals and in Washington do not see that we get the roads needed under a social and business economy geared to highway transportation.

IT COSTS LESS TO BUILD GOOD ROADS THAN TO HAVE POOR ROADS

Old Bridge Restored Economically With

Corrugated Steel Plate Floor

County repair project, costing a fraction of the price of a new bridge, based on common finding that curing a sick floor often raises the safe load carrying capacity of the entire bridge

By Forest H. Green

Associate Professor of Highway Engineering
Purdue University, Lafayette, Indiana

BROWN Street Bridge, at Lafayette, Indiana, is back into full use, after several years of restricted traffic despite repeated temporary repair jobs. A contract was completed late in 1951 under which the old and inadequate floor structure was completely rebuilt to modern standards. The bridge is now beginning a new period of service, carrying unrestricted traffic on a smooth riding and durable surface.

The situation typified one of the most serious problems faced by highway administrations today. The bridge was old, but structurally sound, except that the floor system had been weakened for many years, and temporary and make-shift repair jobs had followed several periods when the bridge had been taken out of service. With the principal parts still sound, and capable of carrying the loads for which originally designed, it was obvious that a major reconstruction project for rehabilitating the floor system could be justified, providing the floor could be replaced in a manner making full use of the structure, without increasing the dead load.

Use of corrugated structural plates, welded on to the existing stringers, covering the entire floor area, and topped by a bituminous concrete surface, was the solution for this project seen to meet these requirements.

The Brown Street Bridge is one of two bridges across the Wabash River connecting Lafayette with West Lafayette on the opposite bank. The four steel truss spans total 571 ft. in length. The roadway width is 21 ft. Partly because of Purdue University in West Lafayette, there is heavy traffic between these two cities, and it was important that this bridge be restored speedily. Although the bridge had carried only passenger vehicles for two or three years, complete closing of this facility presented a serious traffic problem. For this reason, the work was planned to include the summer vacation period. The type of construction chosen made quick completion possible.

Pierce and Gruber, consulting engineers, of Indianapolis, were retained by Tippecanoe County to prepare plans. The contract was awarded to Ruckman and Hansen, of Fort Wayne. Work was started in May; the bridge was opened August 16, 1951.

★ (Above): How mono-rail crane-way was erected to transport floor materials. Saved labor, cut cost of job

Thorough Check-up

Because of the bridge's condition a thorough inspection throughout was necessary. The steel trusses were found in generally good condition, except that many were in need of paint. However, two floor beams near the east end, over the river bank, were seriously deteriorated, and had to be replaced. Many stringers were badly rusted, and it was provided in the contract for all stringers to be carefully inspected as floor removal progressed, and all defective members replaced.

The expansion rollers were also found to need repair, and the contract work eventually included removal of all eight rollers, turning them in a lathe, and replacing them after the entire assembly had been cleaned and painted. The entire bridge-shoe assemblies at the east end were replaced. New mud-walls at each end were added later, as an extra contract item. The work also included repair of a deteriorated pier.

Floor Repair Method

Because of the need for a thorough inspection of each stringer and floor beam, and for the replacement of some of the stringers, it was necessary to remove large sections of the old wood flooring before the new steel floor could be placed. Reconstruction of the pier also complicated the planning of the work. Because of these problems, it was decided to construct and overhead, single-track conveyor system, consisting of a continuous welded section of I-beam, suspended

★ The old, weak timber floor looked like this. A source of traffic accidents, despite load limits

★ Old stringers uncovered for replacement and repair. Note rusted condition of outer members

from the sway bracing of the trusses. A chain hoist was carried by a small car, which moved along the overhead track. The old flooring material was taken to the end of the bridge by this conveyor as removed, well ahead of replacement operations. New stringers were also brought out to the position where needed by this means.

In placing the concrete in the pier repair work, a truck mixer was backed out on to the new flooring, and the concrete was then transported the remainder of the distance to the pier by the conveyor. This equipment permitted efficient planning of the work, allowing most of the major operations to be carried on simultaneously.

After the old flooring was removed on each panel, floor beams, stringers, and truss connections were inspected. Stringers showing structural weakness from rusting were replaced. In addition to two floor beams completely replaced, there were a few other places where repairs were made to beams by the addition of new material, using a cutting torch and welding equipment.

Except for panels near the ends, replacement of structural steel was not as extensive as was first expected. All outside stringers were replaced, according to contract. Repair and replacement of structural floor members progressed rapidly, and followed the removal of the old floor from one span to another, across the bridge.

The contract included an item for cleaning all steel in the entire structure, and application of two coats of paint. The floor system steel was cleaned and painted as repair progressed, before placing new flooring. This enabled the painters to work from the top, eliminating much scaffolding. The trusses were painted during the floor construction, which permitted final work on various phases of the contract to be completed almost simultaneously.

Placing Corrugated Floor

After the floor system on the east span had been repaired, cleaned, and painted, installation of corrugated structural plates was begun. This steel flooring was furnished by the United Steel Fabricators, Inc., of Wooster, Ohio, who supplied the steel in units 10 ft. 3 in. long (one-half the width of the floor) and 33 in. wide. These sections were moved to position by the conveyor and hoist. They were then welded to each stringer in alternate valleys of the corrugations, through shop-punched welding slots. This work although a major part of the project required less than four weeks. Only occasional adjustments were needed in placing the plates, and these were carried out by the use of a cutting torch and welding equipment.

When the floor plates had all been installed, there remained the placing of a wearing surface. The flooring was given a light prime coat of cut-back asphalt, MC-1, then a binder course of bituminous concrete having ½-in. maximum aggregate. The mix was spread mechanically to provide ¼-in. compacted depth above the highest part of the corrugated sheets. The material was then thoroughly rolled with a 10-ton roller.

A bituminous concrete surface course was then applied to provide a total depth (both courses) above top of corrugations of 2 in. at the center and 1½ in. at the edges.

Except for requirement of additional rolling to insure uniform

★ During placement and after completion of the new corrugated structural plate floor. Welding equipment seen in left view

★ Old rusted bearings were removed, re-turned on a lathe, and restored, and bridge shoes renovated so they would again perform as designed. (Right): Pier tops after repair job which included partial recapping

compaction, because of the thickness variation over the corrugations, the bituminous construction was similar to that for ordinary highway work, and the resulting pavement has the smooth and non-skid characteristics expected on a street or highway.

This project cost the county about $60,000, a small fraction of the cost of a new structure. The bridge was closed for eight weeks, a shorter time than first thought necessary.

Melvin Stirlen was superintendent for Ruckman and Hansen. Milton Leverenz was inspector. G. O. Keilholtz is County Highway Superintendent of Tippecanoe County.

The rehabilitation of the Brown Street Bridge was successfully accomplished in a minimum of time, and with a significant saving in highway funds. It is believed that this general method of reconstruction frequently may be the answer to problems arising in this important phase of highway administration.

AASHO Leaders Ask $810,000,000 Annual Federal Aid

The Chief Administrative Officers of the Member Departments of the American Association of State Highway Officials, met in Chicago, Illinois on November 27, 1951, to consider a national policy statement for submission to Congress in connection with new Federal-aid highway legislation to be taken up in 1952. In accordance with the constitutional procedure of the Association, the following national policy was approved:

1. Four authorizations for regular Federal-aid Funds on an annual basis:

System	Amount Recommended	1950 Act Authorization
Interstate	$210,000,000	$
Primary	270,000,000	225,000,000
Secondary	180,000,000	150,000,000
Urban	150,000,000	125,000,000
	$810,000,000	$500,000,000

2. The Federal-aid Primary, Secondary, and Urban allocations should be distributed among the States in accordance with the regular formulas and matching basis as provided in the Federal-aid Highway Acts of 1944, 1948, and 1950 (these provisions are that all funds be matched on a fifty-fifty basis; the Primary funds being apportioned on a formula of ⅓ population, ⅓ post-road mileage, and ⅓ area; Secondary funds being apportioned on the formula of ⅓ rural population, ⅓ post-road mileage, and ⅓ area; the Urban funds being apportioned on the basis of population of Urban areas).

3. The Interstate funds should be apportioned on the basis of population of the States except that no State receive less than ¾ of 1%, as was provided in the recommendations of this Association to the Congress in 1950, and as was embodied in HR. 7941 as passed by the House in 1950, and that the matching ratio be on a fifty-fifty basis.

4. (a) For forest highways there should be authorized the sum of $32,000,000 annually; (b) that for forest development roads and trails there should be authorized $28,000,000 annually; (c) that for the construction, reconstruction, improvement, and maintenance of roads and trails, including necessary bridges in national parks, monuments, and other areas administered by the National Park Service, there should be authorized $16,000,000 annually; (d) that for the construction and maintenance of parkways to give access to national parks and national monuments, or to become connecting sections of a national parkway planning, there should be authorized $17,000,000 annually; (e) for the construction, improvement, and maintenance of Indian Reservation roads and bridges, and roads and bridges to provide access to Indian Reservations

(*Continued on page* 102)

★ Looking across the bridge after repairs completed—a safe, smooth riding roadway; a bridge good for 12-ton loads for many years

$217 Million Diverted In 1950

State highway use tax revenues totaling $217,038,000 were diverted to non highway purposes in 1950, according to data released by the Bureau of Public Roads. This is a new high in dollar volume, and brings the 1924-1950 total diversions to $3,060,508,000.

Rhode Island again led all states in 1950, in percentage diverted, by using 47 cents of every highway use tax dollar for non-highway purposes. New Jersey was second with 42.2 cents diverted from each dollar received. California led in dollars diverted, with $11,488,000, followed by New Jersey and New York with $30,842,000 and $28,915,000 respectively. Twenty states now forbid such diversion by constitutional amendment, while virtually all the other states divert varying sums.

Critical highway deficiencies in many states have led to demands for additional revenue. Yet, diversion continues to drain the funds necessary to bring the highway plant up to an adequate level. A bulletin from the National Highway Users Conference notes that some states (such as New York where a new ton-mile tax law was adopted this year) increased their highway use taxes while continuing diversion, while others have resorted to the toll method of highway financing while continuing to divert to an alarming degree. New Jersey is the prime example of the latter. Florida, where a toll highway from Jacksonville to Miami is under consideration, diverted the equivalent of one-fifth of the estimated total cost of the proposed road.

Examples of High-Speed Concrete Pavement Construction on the Pennsylvania Turnpike, 1951

Project A (Myers)

Best day — 2,234 feet in 11 working hours
Best weekly average — 10,101 feet in 50 working hours
Equipment used:
1 dual drum paver
1 spreader
1 finisher
1 longitudinal float

Project B (Patterson)

Best day — 1,245 feet in 10 working hours
Best weekly average — 11,206 feet in 48 working hours
Equipment used:
1 dual drum paver
1 spreader
2 finishers
1 longitudinal float

Project C (Baltes)

Best day — 2,375 feet in 12 working hours
Best weekly average — 11,202 feet in 53 working hours
Equipment used:
1 dual drum paver
1 spreader
1 finisher
1 longitudinal float

Project D (Maskuda)

Best day — 4,084 feet in 12 working hours
Best weekly average — 16,470 feet in 50 working hours
Equipment used:
2 dual drum pavers
2 spreaders
2 finishers
1 longitudinal float

Project E (De Felice)

Best day — 6,166 feet in 10 working hours
Best weekly average — 27,668 feet in 124 working hours
Equipment used: 2 complete sets of paving equipment including—
2 dual drum pavers
2 spreaders
4 finishers
2 longitudinal floats

All of the pavement placed in 12 ft. lanes, 9 in. thick, and hence ran ⅛ cubic yard per lineal foot, or 3 lineal feet of pavement per cubic yard of concrete.

Your 2-Way Radio May Detonate Electric Blasting Caps

The Pennsylvania Highway Department has recently given this warning to its personnel:

"Information and tests show a real danger of exploding dynamite caps if a two-way radio transmitter is used within 20 feet of an uncoiled wire on the caps. Never carry dynamite caps in a car or truck equipped with two-way radio."

The warning continued that caps shall be transported in metal containers, never opened in the vicinity of a transmitter and a transmitter should not be operated within 50 ft. of any electric blasting operation.

The increasing use of two-way radio in vehicles used for investigation or exploration, and in construction vehicles indicates that all concerned should be adequately informed concerning this hazard. The distances established in the material quoted above apply only to low power, short range vehicle radios. There may be a hazard of sufficient induced current to fire a cap at much greater distances, up to a mile, if the transmitter is a high-power broadcasting station. For further information see section on extraneous electricity in Blaster Handbook (Du Pont), 12th edition.—From the "Safety Bulletin," Chief of Engineers, Safety Division, Washington, D.C.

Oregon Leads Highway Scrap Drive

The Oregon State Highway Department unearthed 8,855 tons of scrap iron and steel during the first three quarters of 1951, according to a bulletin from the Scrap Recovery Subcommittee of the A. A. S. H. O., with J. J. Laing, Secretary.

Oklahoma ranks second with 7,700 tons and Iowa third with 2,972 tons.

Much greater tonnages are sought as a part of the nation's drive to relieve the acute shortage of scrap necessary to full scale steel manufacture.

A three-point program is recommended for the highway field:

1. Better organization of highway departments, construction contractors, equipment dealers, material producers, and all other elements of the highway field in locating and speeding scrap disposal, speeding the disposal of ferrous and non-ferrous scrap.

2. Helping convert to scrap dormant materials found along rights-of-way.

3. Helping in the movement of off-highway scrap collections to disposal areas where such service is lacking.

Better Use and Management of Machines Challenges Road Maintenance Men

We still have far to go in the transition from hand methods to mechanical methods in maintaining America's highways. This statement, ably summing up the case for increased mechanization, is the Introduction to a voluminous report by Mr. Radzikowski. Entitled "Management of Mechanized Highway Maintenance," the report has four parts: (1) Mechanization of Maintenance Operations, (2) Selection of Balanced Equipment Fleets, (3) Care of Maintenance Fleets, and (4) Managerial Control of Maintenance Equipment. The report is part of the Bureau of Public Roads program of documentation on the "Theory and Practice of Highway Improvement and Utilization in the United States of America."

By H. A. Radzikowski
Chief, Maintenance Branch, U. S. Bureau of Public Roads, Washington, D. C.

WHEN tools were taken out of human hands at the turn of the century and given power of their own, an economic chain reaction was started which by 1950 resulted in a gross national product (the value of all goods and services produced in the United States) of 280 billion dollars per year. During the fourth quarter of 1950, the annual rate was 300 billion per year, while in 1939 it was only 90 billion dollars per year.

Output per man-hour, measured in constant value dollars, increased at the rate of 2.1 per cent per year in the prewar decade and is now advancing at a rate of 2.5 percent per year. In recognizing annual improvements and increased productivity per man based on technological advancements, the industry of this Nation has found it possible to increase salaries of employees. This, in turn, has influenced the technological improvement of highway maintenance operations and resulted in increased salaries for highway maintenance employees.

Following are examples of increased production in industry:

1. Recent mechanization of an underground mine near Pittsburgh, Pennsylvania, resulted in the production of two tons of coal a minute with one man at the controls, compared with hand production of five to six tons per day by one workman.

2. At one time, it required 57 man-hours of labor to grow and harvest an acre of wheat yielding 20 bushels. Today, technological advancements make it possible to produce an acre of 20-bushel wheat with less than four man-hours of labor. The farmers of today are assisted by an estimated 12 million vehicles and other mechanical aids, about 760 million horsepower of mechanical energy.

Industrial Comparison

One automobile company has checked its records and found that in 1908 its employees worked 60 hours a week for $12 in wages. (In terms of 1947 dollars, that was really $28.35.) That year, 1908, this company began buying machinery to replace some hand tools. The process continued steadily until by 1948 the company had about $6,000 invested in equipment for each employee. (In terms of what it would cost to replace that equipment in 1948 dollars, the investment was about $10,000 for each employee.) And in 1948, the company's average employee earned $67 a week—more than double his "real wage" of 1908 in terms of purchasing power. He worked 40 hours a week instead of 60 hours. He earned more because, with machinery, he could produce more. And his work was easier. Muscular effort accounted for only 5 percent of the total work done.

In that same automobile company in 1908, it took one skilled tinsmith 8 hours working with hand tools to shape the top half of a gasoline tank. Today, a $45,000 machine operated by three men does the same job in 20 seconds. If men still used hand tools on that job and were paid $67 for 40 hours of work, the labor cost of building the top half of a gasoline tank would be $13.40. Today the actual cost is 2½ cents.

The illustrated reduction in production costs in the automotive industry is the result of over-all efforts of the corporations to meet competition. It required the retention of technicians and industrial managers to study the various processes or mechanical aids used and to recommend less costly processes or more productive types of machinery. It required men with a background of knowledge of what is being done by other members of the industry and of new machine tools, new welding methods, new de-

★ How much manual labor is justified on road maintenance in these times of high labor cost, scarcity of workers and availability of a great variety of specialized labor saving power equipment? (Roads and Streets staff photo)

velopments in the heat treatment of steel, alloys and other technological advancements, as well as a knowledge of the durability of the resulting product in actual service.

Must Gauge Efficiency

In industry, management devises procedures for checking its efficiency. The following illustration is given to show the diligence that must be exercised in the management of mechanized highway maintenance to assure the adoption of the most efficient methods.

On a recent visit to a large electrical manufacturing company with respect to radio equipment used in mobile road equipment, an illustration of how production costs were kept on a competitive basis was observed. That company has a number of divisions and plants located in different parts of the country. The division for mobile equipment needed some tubes for the assembly of radio sets. In order to secure those tubes, they advertised among all of the company divisions and plants that had the capacity to produce such tubes. They also advertised with outside firms. An outside firm was the low bidder and their own branch submitted a higher bid. The outside bid was accepted. That meant that their plant would re-study their production costs to see how they could meet their competitors on future orders. Here was an illustration of a gauge of production efficiency based on competition.

Road Methods Advance

Highway departments have not been idle during this mechanical revolution. The entire highway plant throughout the Nation, including all roads maintained by States, cities, and other agencies of local government, is estimated to have required about 90,000 less men for maintenance and operation of the roads in 1950 than in 1936. This is a considerable decrease in manpower. It is equal to the population of a fair-sized city. Yet most of the roads now require more maintenance work since they are older, many miles are obsolete, and all carry much more traffic both in volume and in weight.

Some indication of the increased productivity of the maintenance man, or at least the increased use of the highways that he was called on to service, may be obtained from the records of the revenue-producing traffic. The following increases have occurred in the service rendered by the maintenance man as measured by the number of vehicles traveling the roads, the vehicle miles of travel on the roads, and the ton-miles of vehicles using the highways.

1950 Percent Increase Over 1936 for each Maintenance Man Employed	
Motor vehicles	122%
Vehicle miles of travel	133%
Ton-miles of traffic	172%

It is to be noted that the 1950 maintenance man was assigned to repair the deteriorations caused on highways by the movement of over 2½ times as many ton-miles of traffic as was the case 14 years earlier.

The development of new production techniques, improvements in the quality of equipment, the extension of mechanization, and better organization of the work, make up in part for the decreased number of maintenance employees.

Some idea of the scope of maintenance can be gained from the fact that highway construction costs in 1950 amounted to about 2.1 billion dollars and maintenance costs to about 1.3 billion dollars. Since 27 percent of the maintenance expenditure was used to provide equipment services, the cost of owning and operating the equipment used in mechanized maintenance operations amounted to over 350 million dollars. Operations, for the most part, were performed under the direction of, and with equipment owned by, the highway departments. While highway maintenance in this country is highly mechanized, it should be noted that an estimated 47 percent of the maintenance dollar goes for labor and that a large amount of hand-labor is still used on this class of work.

★ Weed sprayer used by Barry County covers 10 miles of road per day on both sides.

Michigan County Uses Mechanical Weed Sprayer

Here is a picture of a machine purchased recently by Barry County (Hastings), Michigan, for use in chemical treatment to kill or reduce brush and weeds along the roadside.

This machine, manufactured commercially but produced in only limited numbers, was custom-built for this county by Commercial Chemical Co., of Gibsonberg, Ohio. According to Roy DeHaven, Engineering-Manager of the Barry County Road Commission, it was purchased as an economy move. Limited maintenance funds have forced this county in the past to neglect roadside weed and brush control, which in turn has added to the problem of snow removal, ditch cleaning and general maintenance.

Four hundred miles of road selected for treatment. Chemicals Esteron 44 and 245T are used, supplied by the Dow Chemical Company, this chemical being expected to kill 75% to 90% of the growth. The sprayer holds 1,000 gallons of the poisoned solution. The unit is mounted on a truck operated by two men who can spray about 10 miles of road, both sides, per day. Two or three applications are being made where the brush is heavy.

The machine is not used on windy days, according to Mr. DeHaven, since the spray might be poisonous to certain farm products grown along the roadside. It is not toxic to animals, however. A problem is foreseen in the disposal of brush killed by the chemical. Farmers are being asked to cooperate.

New York State Seeks 1952 Graduates

The New York State Department of Public Works has widely publicized the advantages offered engineering graduates. Students due to graduate in June, 1952, have been urged to take an examination this winter, to get set for entering the Department. Successful candidates who pass examination for Professional Technical Assistant will be eligible for permanent appointment as Senior Engineering Aides, starting at $3237 per year.

JOB and EQUIPMENT IDEAS

Euclid Loader Used on Vertical Bank

An unusual and highly productive use of a Euclid earthloader is pictured here. This machine, which is normally used to take a cut from 12 to 24 in. deep in relatively soft boulder-free soil on the level, is used here on a nearly vertical slope.

The project is Harlan County Dam Project at Republican City, Nebraska, the contractor Harlan Construction Company of that city, made up of seven of the large contractors of the West and Middlewest.

The loader is working an extensive borrow pit, with the help of an 11 ft. vertical blade which takes a 3 in. bite from the wall of the pit.

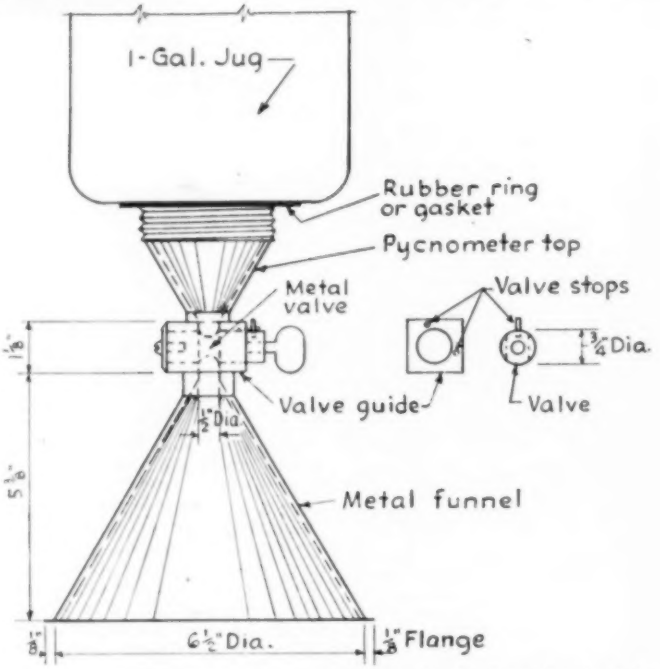
Truck tractors pulling 37 cu. yd. capacity earth dump trailers are being filled by the loader as it is drawn along by two TD-24 International tractors working 20 hours a day.

Sand-Funnel Apparatus Determines Field Densities Of Soil Mixtures

A practical method of determining the in-place density of soil and soil-cement in roadways, embankments and similar work, is by use of the sand-funnel, field density apparatus.

This method is described in the data sheet, "Use of Density Apparatus (Sand Method) for Determination of Field Densities of Soils and Soil Mixtures In-Place", obtainable from the Portland Cement Association, 33 West Grand Ave., Chicago 10, Ill. It describes testing procedures in detail, discusses the accuracy of the method and lists recommendations for manipulation and procedure to obtain accurate results.

This apparatus has 6½-in. flanged funnel-opening at the base, a 1-gal. capacity jug for the sand and a ½-in. orifice between the jug and funnel. A valve between the jug and funnel controls the flow of sand. The large-size funnel and jug permits digging of a large hole, facilitates easy removal of material and makes possible a high degree of accuracy.



★ Euclid loader with International TD-24 tractors loading 37 cu. yd. semi-trailer dump wagons at Harlan County Dam.

"Waffle" Roller Used On California Project

Considerable interest is centered in the use of a new roller developed by one of the roller manufacturers (Buffalo-Springfield) embodying an open-type of front roller drum, as shown in the accompanying picture. The roller thus equipped was used by The Baun Construction Company of Fresno, California, to compact soil-cement

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling on Louisiana Pipe Line Project

The Houston Contracting Co., Houston, Texas, has recently completed the laying of a pipe line for the Texas Gas Transmission Co. near Shreveport, Louisiana. Equipment performed smoothly and dependably with the help of Gulf quality lubricants and fuels.

THE Houston Contracting Co., like many other leading contractors, has a proven formula for making equipment deliver beat-the-schedule performance: Gulf quality lubricants and fuels, plus careful maintenance. This formula pays big dividends.

Always of the same uniform high quality, Gulf lubricants and fuels work as a team to help contractors do a speedier, more profitable job. Gulf lubricants provide an extra margin of protection against mechanical delays, and Gulf fuels insure maximum engine power and efficiency.

Write, wire, or phone your nearest Gulf office and arrange to use Gulf quality products on your next job. Along with that good Gulf service, they are quickly available to you through more than 1400 warehouses located in 33 states from Maine to New Mexico.

Gulf Oil Corporation · Gulf Refining Company, Gulf Building, Pittsburgh 30, Pennsylvania.

GULF

★ Roller used on soil-cement base and surface courses by Baun Construction Company

treated base, base course plant-mix surface, and the finished course on a 3-mile section of Manning Road in Fresno County.

The contractors are quoted as reporting a higher compaction of the soil-cement base as a result of the "islands" in the front roller cylinder. Also faster rolling time on the plant-mix base. Despite variations in base thickness a smooth riding road was produced.

How to Keep Your Aggregates Separated

A good idea not seen in use very often is depicted in the accompanying photograph, showing a double-walled barrier between stone and sand stockpiles at a batching plant.

★ Aggregate piles were kept separate by these portable carrier units.

This barrier consisted of sections which could be picked up easily by a crane and loaded on a truck. Their shape assured stability in case of higher stockpiling on one side than the other, and the big point is that they definitely and completely kept sand from spilling over into the stone and vice versa.

John Swanger of Lancaster, Pennsylvania, was the contractor. This setup was for a section of the Eastern Extension of the Pennsylvania Turnpike.

How to Pick Up Heavy Road Forms

Ordinary road forms are heavy enough but the big special forms available these days for 12 to 15 inch thick or thicker concrete runway slabs require special handling because of their weight.

The accompanying snapshot shows

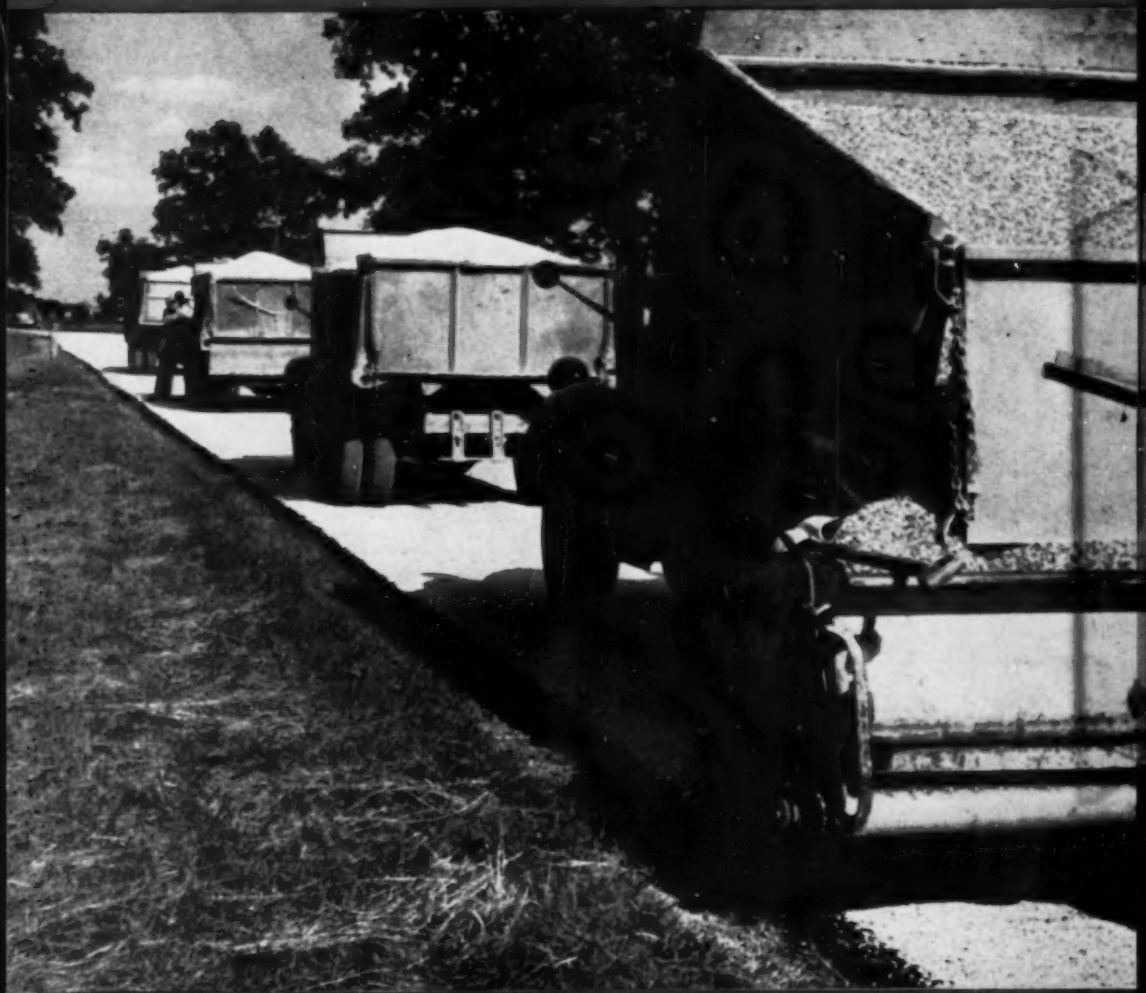
★ Form handling equipment used by Arcole-Midwest on O'Hare Field in Chicago in connection with runway construction

the way that form sections are picked up, loaded, moved ahead and set off at O'Hare field, near Chicago. Arcole Midwest Construction Company, of Evanston, Ill., used this equipment which consisted of a small stiff-leg operated by power take-off from the transmission. The hoist rope was attached to a pair of "ice tongs," designed to hook under the horizontal stiffener angle located mid point back of the form.

●

"Pavement Marking" is the title of a bulletin (No. 36) issued by the Highway Research Board. Covers two papers on this subject and a committee report presented at the 30th annual meeting of the Board last January. Available without charge to members of the Highway Research Board, 2101 Constitution Avenue, Washington, D. C.

Bituminous ROADS AND STREETS



Published by Asphalt Institute, Incorporated
32 West Randolph Street, Chicago 1, Illinois

Cover Scene

Surface treatment work in progress, Kane County, Illinois; with trucker lined up behind the chip spreader at lunch time. Note even edges, uniformity of chip application, reflecting the exacting work required by this county. Contractors Burridge Bros., of Elgin, Ill.

How to Build for Heavy Traffic? One State's Answer
Hot Seal Chips Tried in Wisconsin Treatment Program
Austin Lays Dust with Emulsion in the Sprinkler Tanks
What States are Doing in Bituminous Development—III
New Equipment and Materials for Roadbuilding

JANUARY, 1952

T. P. H.

...pick a plant

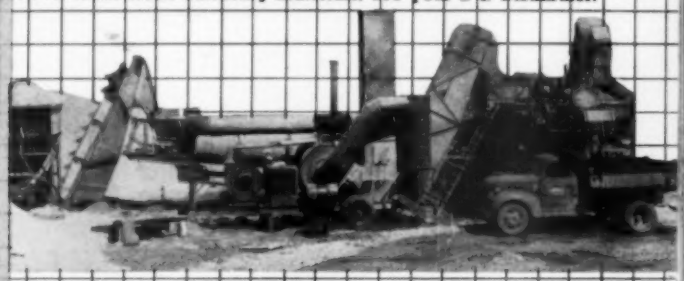
B-G MODEL 840 PLANT

B-G MODEL 845 PLANT

The worldwide acceptance of Barber-Greene Bituminous Mixing Plants is due to their many exclusive advantages that assure profitable, successful operation. For example:

- True portability, easy erection and disassembly
- Accurate, consistent control
- Versatility to produce all classes of mixes economically
- Capacity ranges from 20 to 200 t.p.h.
- Complete equipment—Barber-Greene is the best source for all your bituminous equipment needs, including Feeders, Hoppers, Conveyors, and Finishers.

To profitably meet the great need for bituminous surfacing materials, see your B-G Distributor.



B-G Model 840 Plant

With a capacity of up to 40 t.p.h, this plant is most practical for a broad range of users. Output is high enough for average-sized construction and resurfacing jobs — investment is low enough to assure profitable operation at minimum capacities or for intermittent operation.

B-G Model 845 Plant

For producing in the 50 t.p.h. range. Highly portable. Designed to produce mixes requiring two, three or four-bin gradation, this plant is extremely compact, easy to erect.

THE PLANT CAPACITY YOU $

see your B-G distributor

OR WRITE BARBER-GREENE COMPANY, AURORA, ILLINOIS, U.S.A.

T. P. H.
with built-in profits
B-G MODEL 848 PLANT
B-G Model 848 Travel Plant
The B-G Travel Plant can produce over 200 t.p.h. of highest quality bituminous or stabilized mixed-in-place material. It mixes in an elevated pugmill, giving full control and eliminating bitumen losses. It has a short mixing cycle, allows the use of heavier bitumens, minimizes wet weather hazards, allows working later — and earlier — in the season.
WANT IN TONS PER HOUR
B-G Model 848 Intermediate Type Plant
Between road mix and "high type" mix bituminous construction, there is a broad range of "intermediate mix" work that is most profitably handled by this plant. With capacities up to 120 tons per hour, this plant can easily be converted to a "high type" plant by adding the B-G gradation unit. Mixer alone may be used in Travel Plant service.
Model 848 Plant with Gradation Control Unit
The addition of the B-G portable four-bin gradation control unit provides a new ease and flexibility in multiple aggregate control. This plant will produce up to 120 t.p.h. of the highest type mixes. Here is the ultimate combination of capacity with uniform high quality and ability to meet the most rigid specifications.
Barber-Greene

When you've more jobs ahead . . .

that Pioneer Edge

How the job was done

After finishing the excavating and grading, Megarry Brothers set up their PIONEER 2-Unit Plant to produce the 60,000 tons of material needed for the job. This plant consisted of a gravel primary (with screen and jaw crusher) and gravel secondary (with reduction roll crusher and sizing screen). The primary was fed by bulldozer and the finished material "dozered" into the stockpile. Later, when the asphalt plant was set up, aggregate for the mix was "dozered" to the feeder hopper. (Note operation of the tractor-dozer in photo.)

When crushing was complete, the gravel plant was moved on to another Megarry job while the PIONEER Asphalt Plant continued to operate from the stockpile.

This is truly streamlined operation . . . and made possible with PIONEER *Continuflo* Equipment. Here is the famous PIONEER EDGE in action . . . offering greater over-all efficiency with *higher output* and *lower upkeep*. Here is the EDGE that enables you to come out with a just profit even when bidding is close.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer
Continuflo EQUIPMENT

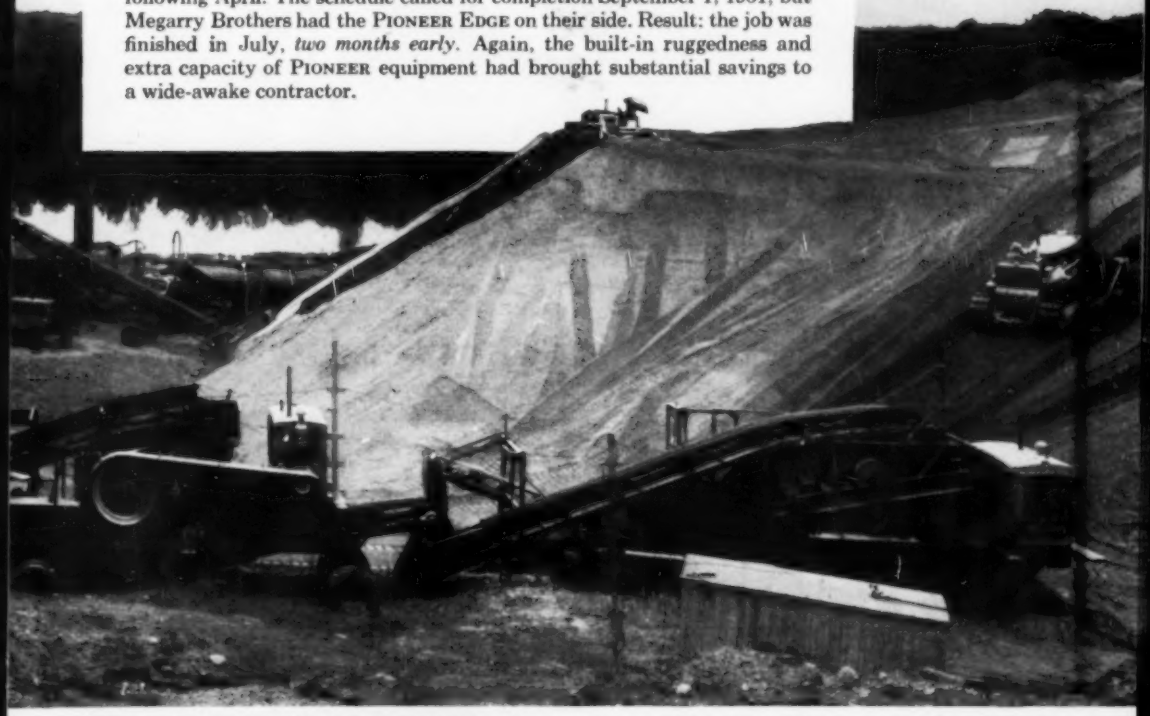
gets you there sooner

Megarry completes job 2 months early

Completing the job ahead of schedule is routine for Megarry Brothers of St. Cloud, Minnesota.

Take, for example, this $256,946.00 job on Minnesota State Highway 7 between Excelsior and Minneapolis. This 12.2 mile stretch called for 16,578 cubic feet of excavation and placing 35,171 tons of gravel base. The resulting 499,420 square yards of surface required 50,686 tons of bituminous mix. Finally, 2,136 tons of seal coat aggregate were placed on top.

Work began October 1950, and after a winter layover, was resumed the following April. The schedule called for completion September 1, 1951, but Megarry Brothers had the PIONEER EDGE on their side. Result: the job was finished in July, *two months early*. Again, the built-in ruggedness and extra capacity of PIONEER equipment had brought substantial savings to a wide-awake contractor.



Megarry Brothers choose Pioneer

● Megarry Brothers have found that dependable equipment is the key to efficient performance on a construction job. Here is some of the PIONEER equipment they own and operate.

1 Model 101 Portable Asphalt Plant consisting of a drier, dust collector, and combination gradation-mixing unit.
1 Auxiliary drier.
2 2-Unit Portable Plants each consisting of a 150 PG Primary and 140S Secondary.
2 40 V Duplex Portable Crushing Plants.
1 38 V Duplex Portable Crushing Plant.
1 305 W Washing Plant.

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● Please send me information on the equipment checked.

☐ BITUMINOUS PLANTS	☐ ROLL CRUSHERS	☐ MECHANICAL FEEDERS
☐ GRAVEL PLANTS	☐ WASHING PLANTS	☐ VIBRATING SCREENS
☐ ROCK PLANTS	☐ APRON FEEDERS	☐ BUZZER SCREENS (LIGHT DUTY)
☐ JAW CRUSHERS	☐ ORO FEEDERS	☐ CONTINUFLO CONVEYORS

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Where the SEAMAN PULVI-MIXER Fits in Airport Construction!

Highway construction too, has many operations that are identical to airport development in which the SEAMAN PULVI-MIXER does the work faster, more efficiently and at a greater saving in costs. Unparalleled in daily output of completely mixed materials the SEAMAN successfully challenges the most extensive projects; low in investment, it is profitable on the smallest jobs. Plan on a SEAMAN in your 1952 operations.

The TRAV-L-PLANT Model of the SEAMAN PULVI-MIXER.
Equipped with pump, spray bar and full tachometer assemblies for application of bitumen or water.
Volumetric meter optional.
7 ft. mixing width. Gasoline or diesel powered.

Send for this FREE book on up-to-the-minute practices in mixing for all types of stabilized construction. Write for Bulletin 25.

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4 times as fast with

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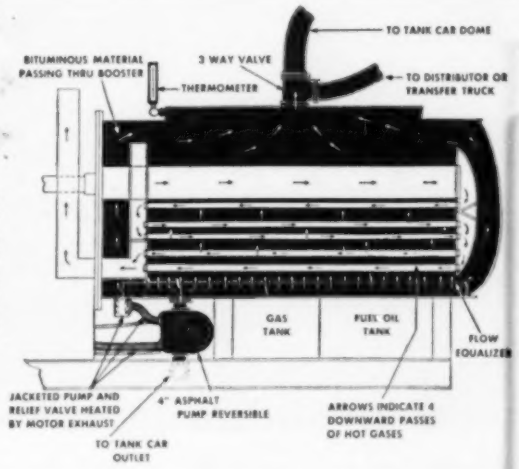
Cleaver-Brooks Pumping Boosters pump, heat, and circulate bituminous material in one operation. Heating is provided directly, without use of steam, by pumping from tank-car (or storage tank) through the heating element of the Booster and back into tank-car. Entire contents of tank-car need not be heated as in one pass through the Booster, bituminous materials are heated to application temperatures and delivered to distributor, transfer truck, or storage tank; circulation of material while heating prevents separation and assures uniform application. No water or steam required for operation.



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Consider, for example, Tarmac's ability to coat the aggregate rapidly and thoroughly, thus reducing mixing time. Plus its ability to penetrate *right on through* dust or moisture, so that there's no need for highway crews to remain idle while waiting for the "right" weather. Important, too, is the way Tarmac resists the stripping action of water, without the use and the extra cost of additives.

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Tarmac MAKES BETTER ROADS

★ The two roadways here each "hit out for themselves" to make best use of topography

TIJERAS CANYON U. S. 66 RELOCATION

NEW MEXICO'S ANSWER TO QUESTION

How Well Should We Reconstruct?

New Mexico has chosen to concentrate available funds on few main tourist and truck routes, going to new higher standard of design for selected relocations. State's most significant recent project here described, including unique streambed detour

By B. G. Dwyre
State Highway Engineer
Santa Fe, New Mexico

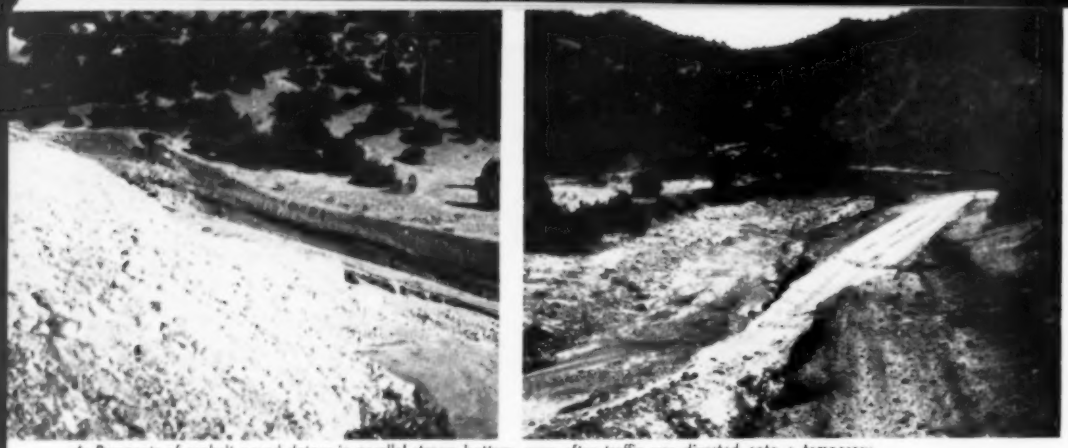
HOW best to utilize limited funds for highway construction, is a problem constantly before us in New Mexico. Recently as a result of weighing many factors, the New Mexico state highway department has chosen to concentrate a relatively large proportion of available construction funds on a few main routes. In fact nearly half of the money has been centered on streamlining our east-west "Main Street," U.S. 66, to make it more inviting to tourists and truckers, both of whom are of great commercial value to the state. Much of U. S. 66 across New Mexico has represented standards of line, grade, width and surface well below that deemed desirable today to carry heavy traffic volumes with safety.

Recently 57 miles of this route have been under contract for reconstruction or resurfacing, representing $6,000,000. Each project has required the exercise of judgment as to what standards of reconstruction shall be followed. Highest in standard and most costly per mile is the relocation nearing completion through Tijeras Canyon, immediately east of Albuquerque. With its completion and eventual completion of improvements east and west of Tucumcari to the East, a bridge at Albuquerque, and a project near Gallup to the West, this route will be in relatively good condition entirely across New Mexico. About 16 miles will have a 4-lane-divided roadway.

Tijeras Design Features

With this preamble, I will outline some of the design and construction features of the 7.9-mile relocation through Tijeras Canyon. A $1,600,000 contract for grading, structures and paving this job was entered into with Skousen-Hise Contracting Co., of Albuquerque, on December 15, 1950.

The old 2-lane highway through this deep and rugged canyon, built in the late '20's, was extremely hilly and winding; its accident rate bad and growing worse. The lack of truck-passing width on grades, alone, virtually justified a relocation. In designing a new route, our engineers made location and economic studies. The final location, while representing some compromise over Inter-State standards for prairie country, constitute the highest ever employed for a highway in our state. The new location has short grades up to 6%, with lower grades wherever economically feasible. Curves are up to 6 degrees maximum and all but a few of the easiest are spiraled. The design speed through the project is 50 mph., this detail indicating the design compromise made for economic reasons. It is expected that special care must be taken in posting speed limits, since the wide, smooth new divided roadway immediately has invited much higher speeds.



★ Remnants of asphalt paved detour in parallel stream bottom, seen after traffic was diverted onto a temporary roadway surface. Location in left scene is a channel change

The project includes two divided 24-ft. paved roadways except for end transitions. Each roadway is graded 41 ft. wide. The prevailing 18-ft. depressed median at one point narrows to 7 ft. (raised) to minimize rock excavation. Elsewhere the two roadways sometimes have completely divergent alignment and grades to meet terrain problems (see photo).

Embankments and subgrade through cuts were compacted to 95% of standard density as determined by AASHO test designation. The chief field problem was to exercise vigilance to secure blending of rock and finer soil materials for best results, and to avoid keying of rock fills without proper filling of voids.

Heavy Flexible Pavement

The pavement design provided for the following layers, pyramiding to assure proper wheel support at the surface edge:

(1) 3 in. minimum compacted depth of granular ballast, placed to 38 ft. top width. This material was crushed and screened to meet definite gradation requirements, designed to assure a permeable, high-bearing-value base. Depth was increased up to 12 in. where poor subgrade was encountered. Specifications for this course called for a P. I. not exceeding 6, and gradation from 2 in. down with 5% to 20% passing 200 mesh. The contractor was allowed to place this course at the rate of 100 tons of material for each hour of rolling. About 75% of the rolling was performed with pneumatic rollers and 25% with steel rollers.

(2) 1½ in. thickness of neat water bonded leveling course placed 35 ft. wide. The aggregate consisted of 1 in. minus graded material, 5% to 15% passing the 200 screen. The contractor had the option of building the lower base course as well as the leveling course with the 1-in. material.

(3) 1½ in. thick hot plant processed asphaltic base, placed 31 ft. wide. The course was originally set up as a road-mixed course, but was later changed to hot plant mix. This represents New Mexico's second forward step recently towards a heavier, higher type roadbed, it being the first instance where both the base (binder) and the surface course were specified as hot plant mix. New Mexico adopted hot plant mix for surface courses on heavily traveled primary routes in 1950.*

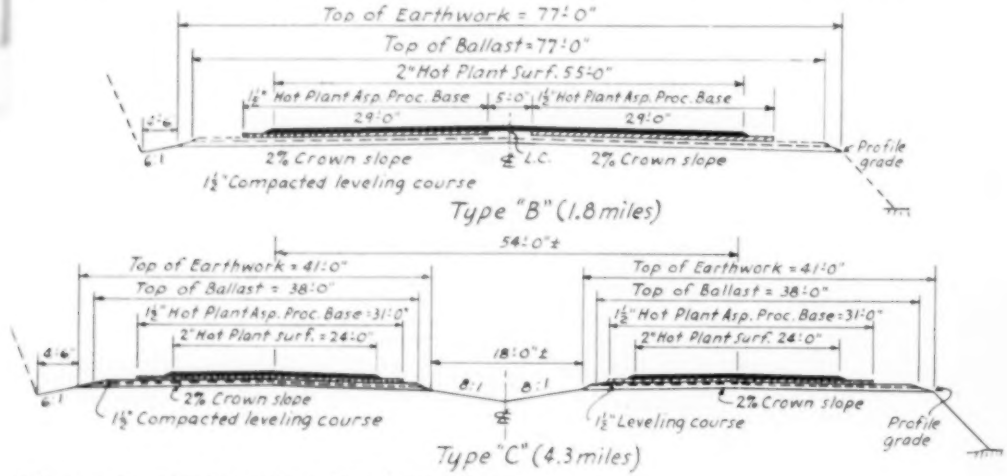
(4) 2 in. thick hot plant processed surface course 24 ft. wide.

The above courses were so placed as to provide 8 ft. outer and 3 ft. inner shoulder width.

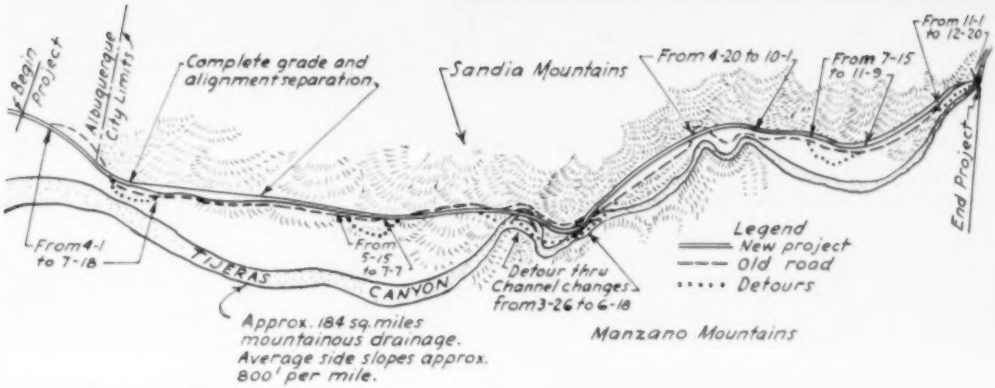
Traffic Handling Unique

An intimate part of the project's design and construction was the problem of handling traffic during con-

*As described in article, "New Mexico Hot Plant Mix Methods," by T. G. Brown and Lindsay F. Root; Roads and Streets, May, 1951.



★ Two types of roadway cross-sections on Tijeras Canyon project



★ Detours and traffic handling scheme through job

struction. The new location in general parallels the old circuitous line, crossing and re-crossing it, and in some places coinciding with the old line so closely that handling of the 4200-a-day traffic during construction was a critical matter. The contractor was required to provide a suitable detour at no additional cost to the state other than furnishing the road oil.

It was originally planned that these detours would be merely a smoothly graded surface given a dust palliative treatment of 0.20 gal. per sq. yd. of MC-1 asphalt. However, this surface proved inadequate, was demolished in a matter of hours by the heavy traffic, and after one initial experiment all detours were surfaced with a road mix mat approximately 1 inch thick using .25 to .35 gal. per sq. yd. of MC-3 asphalt with pit run granular material as aggregate.

The contractor elected, with engineer permission, to use a novel scheme for detouring traffic through sections of the canyon during the early months.

At several points this scheme involved placing temporary paving in the dry bottom of the parallel stream (including channel changes). This step saved excavation and fitted readily with early grading operations. The contractor's crew dozed away boulders, leveled the stream bottom where necessary, and cut down banks where the detour entered or left the roadbed. Coarse rock from cuts was placed in the bottom of the channel in some instances, and dozed into place to form the toe of the permanent roadway fill where immediately adjacent to the stream.

"Operation Stream-bed," (see sketch) constituted Phase 1 of traffic handling through the job. Traffic was routed thusly during most of the 1951 summer, while the bulk of the grading and structure work was completed.

As the rainy season approached, the contractor prepared for detour Phase 2, which consisted of carrying 2-way traffic on a temporary surface on one of the new roadways.

Just in Time

The temporary new roadway surface was readied none too soon. Within a few days after traffic was diverted out of the stream, the late summer rains came. The flow largely washed out the asphaltic mat from the stream bottom, incidentally saving removal expense. For Phase 2, wherein traffic used one of the new roadways, the contractor in some places had to improvise hurriedly by placing a thin covering over the bare rock subgrade.

Where the plating material or subgrade surface was not suitable for oiling, a part of the ballast course was placed and an approximate inch of this blended with MC-3 asphalt as a temporary riding surface.

As noted previously, the contractor had the option of using 1-in. leveling course aggregate for the base, in lieu of 2-in. base stone. This proved advantageous, since the 1-in. material provided a better mat when part of it was blade-mixed with oil to serve as a temporary (Phase 2) detour surface. This surface had to be reshaped later in preparation for the leveling course.

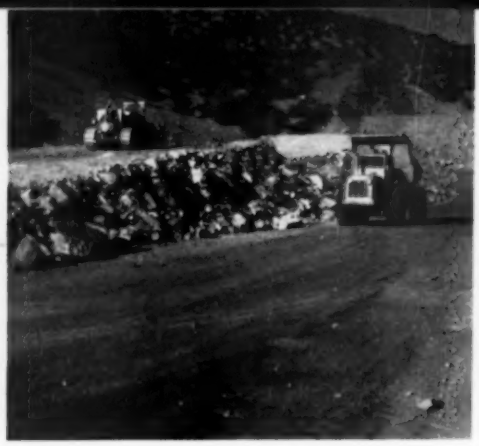
Adding to the contractor's problems was the frequent difficulty of handling traffic and also balancing his yardage, where the excavation from one roadway supplied all or most of the fill yardage for the other.

Asphaltic Mix Designs

Asphaltic concrete designs in New Mexico are the work of the Highway Testing Laboratory located in Albuquerque.

The design for this project was routine except that some consideration was initially given to the use of a limestone coarse aggregate with a sand filler. However, this would have entailed considerable blending. As there

★ Traffic on the left roadway is using a temporary bituminous surface (see article)



★ High speed rock wagons worked with a second shovel on long distance hauling

High Capacity Aggregate Plant; Hot-Oil Heater and Automatic Temperature Controls for Asphalt—Features of Skousen-Hise's Tijeras Canyon Equipment

(Supplementing the accompanying article by Mr. Dwyre)

Stone Production: 58,000 tons 2-in. ballast stone; 53,000 tons 1-in. base and leveling course stone; 28,000 tons ¾-in. stone for hot plant mix surface course; 24,000 tons chip stone for sealing surface course.

Stone Plant: A Pioneer 150-ton-per-hour assembly, consisting of—

Truck trap and pan feeder
Grizzly
Elevator belt, 24" x 50' with 10-hp. electric motor
Pioneer Model 46-VE aggregate plant, with 10x36 jaw and 40x22 roll crusher; screen with 20 h.p. electric motor, return belt with 5-hp. electric motor. Caterpillar D17000 diesel plant with 40-kw generator, V-belt operated on separate shaft; belt drive from engine for jaw and roll crushers; electric power for conveyor and screen motors
Belt to 21-yd. truck loading bin

Asphalt Production: 28,655 tons of asphalt mix produced in plant owned by Tri-State Paving Co., a combine of three road contractors.

Asphalt Plant: Pioneer assembly, consisting of—

Trap and pan feeder
Cold elevator belt, 24" x 60'
150 ton per hour drier
Dust collector, which saved minus-200 material for re-use
Hot elevator, bucket type
Vibrating screens
Three hot aggregate bins
Calibrating gates into pugmill
Two 600-gal. fuel storage tanks (1 diesel, 1 gasoline)
Two 12,000-gal. asphalt storage tanks equipped with thermometers
14,000-gal. burner fuel tank

Power Units: General Motors diesel "671" engine with 75-kw. generator ran dust collector, drier, cold elevator and hot elevator; similar motor for pugmill, screen vibrator, and synchronized aggregate and asphalt feeds

Heating Unit for asphalt tanks: Hy-Way low-pressure hot-oil heater (25 psi. max.; no steam) with Iron Fireman burner-pump-blower unit, 110-220-V. electric motor operated from an Onan light plant when asphalt plant not running and via transformer from a generator on one of the diesels during operating hours. Asphalt tanks were held to desired temperature by electric solenoid on-off controls, one on each tank.

Oil pump, electrically operated

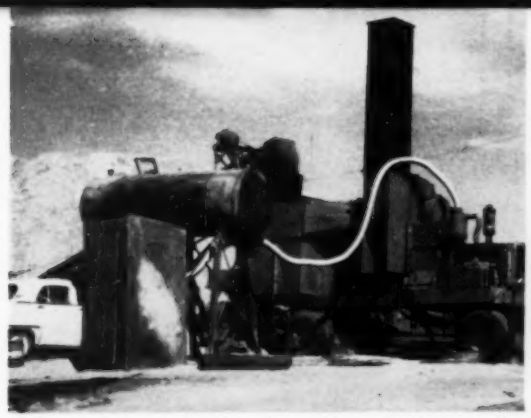
Temperature recorders, consisting of Brown electro-pyrometers—two in number—used. One such unit recorded temperature of aggregate as it came out of the drier (325 deg. ± 20 deg., as required by N. Mex. specifications), and second unit installed by contractor for checking temperature of mix coming out of the pugmill (300 deg. approx.)

Miscellaneous Equipment

Michigan ⅝-yd. truck crane with McCaffrey drag-bucket for loading pit gravel to trucks for crusher

Scoopmobile loader used for stockpiled leveling course aggregate. Hot plant fed by dozer

★ Dumptors were used for the earlier grading phase where the haul roads were steep (right): tractor-drawbar-connected wagon drill, braced in an upright position, ready to pick up and roll to a new position



★ The asphalt plant for the Tijeras Canyon job, see details in a supplement to article

was ample suitable gravel with sand filler available, it was selected as more economical and practical.

Our laboratory bases the gradation of aggregates on Fuller's curves for the most part, with some variation to conform to the ability of the individual pit to meet these requirements. Our specifications for aggregate require a Los Angeles wear of not more than 50 and in the case of crushed gravel not less than 50% by weight shall be particles having at least one fractured face. The Plasticity Index of the filler shall not be more than 6. Aggregates must meet the following grading requirements percentage by weight passing square-mesh sieves:

Sieve Designation	Percent Passing
¾ inch	100
⅜ inch	60 — 80
#4 Sieve	40 — 60
#10 Sieve	25 — 45
#40 Sieve	12 — 25
#200 Sieve	5 — 10

At least 10% of the total aggregate shall pass a No. 4 Sieve and be retained on a No. 10.

On this project it was further specified that the aggregate retained on the No. 4 Sieve be stockpiled separately from that passing this sieve.

The Marshall method of design for asphaltic concrete mixes is now used almost exclusively in this state. On this project we were well above the minimums set by Marshall for stability of mix, flow value, and percent of maximum theoretical density. Marshall test values are: stability 1500 pounds, flow values from 12 to 20 in one hundredths of an inch deformation, and theoretical percent density in a range of 92 to 98 percent.

The optimum asphaltic content is determined on the basis of 70% to 75% of the aggregate voids filled, consistent with the demands made by stability, flow, and theoretical density. 5.5% of 85-100 pen. asphalt by weight of mixed material was used in producing the 2 inch hot plant surface course and 5.2% in the stabilized base of leveling-course gradation. An Immersion-Compression test as devised by the Bureau of Public Roads was run on this aggregate. The results showed no need for an additive to insure adhesion of the bitumen.

On-Job Control

A field laboratory was located at the hot plant. With a Marshall machine our inspectors were able to make the same determinations for stability, flow value, and percent of theoretical density made by the main laboratory when the mix was designed. Five or more briquettes were made each day from material obtained directly from the plant pugmill. In addition to the determinations mentioned above we were able to make a quick check of approximate asphalt content by determining the specific gravity of these briquettes, compacted to maximum density.

In addition to these checks made at the plant three or more rings were embedded in the pavement by our inspector at the paver. These rings were extracted on the following day, one of them being submitted to the main laboratory and the others tested by the field laboratory crew to determine the bulk density after rolling. Asphalt extractions were also made from them by use of a Rotarex centrifuge using benzol as a solvent. Gradations were run on the recovered aggregate. Gradations were also run at intervals through each day's operations of the dry combination from the three bins of the plant. This use of the Marshall method of design and incorporating it into our job control have proved

(*Continued on page 76*)

Some of the Quantities

(4 lanes, 8 miles)

Unclassified excavation	951,700 c.y.
Structure excavation	4,970 c.y.
Pipe culvert excavation	6,050 c.y.
Borrow excavation	35,000 c.y.
Overhaul	2,233,800 sta. yd.
Overhaul (¼ mile)	63,700 ¼-mi. yd.
Mechanical tamping around structures	2,790 hrs.
Rolling, sheepsfoot roller	3,080 hrs.
Rolling, steel roller	1,235 hrs.
Rolling, pneumatic roller	2,880 hrs.
Crushed ballast	57,800 tons
Crushed leveling aggregate	53,600 tons
Hot plant mix	28,655 tons
Structure concrete	6,600 c.y.

★ Aggregate plant power: direct belt from engine to crusher; current from overhead shaft generator for conveyor motors

★ The City of Austin's emulsion-in-the-sprinkler program here is taking in a ball park area

Dust Laying Problem?

This City Just Adds Asphalt Emulsion in its Sprinkler Trucks

The cost is about 4 cents per square yard, the results such that the investment in 500,000 gal. of emulsion annually is considered a bargain

By Noble E. Latson, P. E.
Asst. Director of Public Works,
City of Austin, Texas

AUSTIN, like so many other U. S. cities, went on a growing spree soon after World War II. We outgrew every public facility—jumping from a big town of 80,000 to a small city of 130,000 in a fast 10 years. Before we realized it, we had some 300 miles of unimproved streets — rough, dusty, gravel streets. An improvement program was planned but city finances were taking a beating from many sources and we had to go slow.

In the meantime, citizens were suffering from dust. Some sickness was blamed on it. The people were growing restless, some downright angry about their unimproved streets. And —they didn't mind letting us know about it; one day my office received 200 calls in a little more than two hours—all about dust.

Little hope could be offered for early relief. Attempts had been made to settle the dust with nothing better than water sprinklers while waiting to get a paving program going. Psychologically, this helped for a while but not for long because the effectiveness was almost nil. It was found that to make water sprinkling even half-way effective would take 150 to 200 trucks working nine hours per day, seven days a week. Naturally, this was out of the question.

How Idea Started

Searching for an answer, I thought back to my days in the oil fields. The oil companies used waste oil to settle dust in their workings. It formed a sort of hard pan surface. But an oil surface on city streets wouldn't do because it never fails to be greasy and is quickly tracked into business houses and homes. The problem was to find something that would mix with water and which could be sprayed on the streets and still not cost too much. Use of emulsified asphalt suggested itself. The more we talked the idea, the more workable it sounded. I talked it over with the representative of an asphalt company. He thought it was worth trying, so we ordered one experimental car of material.

So that people wouldn't think the dust had driven us out of our minds, we went to work in a remote section of the city—hid out. First we used 200 gal. of emulsified asphalt to 800 gal. of water. It didn't work—too much asphalt. Then we cut the mixture down to 150 gal. of asphalt. It was still too much. We finally settled on 75 gal. of emulsion to 925 gal. of water for the first application and then 50 gal. per tankful for additional sprayings. Each 1,000 gal. of emulsion thus used will sprinkle three city blocks or about 3,000 sq. yd.

The streets were prepared by blading, rolling and watering until a smooth surface resulted, then came the first shot of 75 gal. of emulsion per truck, a wait of a few days, and a second truck pass with 50 gal. per truck. A third application of 50 gal. was put down after another wait of a week or 10 days. By this time, we found the street to be in good condition for a least 30 days. Usually it was necessary to sprinkle only about once a month—quite a contrast to what we had been doing with water alone.

Originally, asphalt spraying was planned only on major thoroughfares. But things went so well that we soon branched out to secondary streets and

finally to nearly all residential streets.

For better coordination we divided the city into four districts—each with approximately the same mileage of unpaved streets. Each area was assigned a sprinkler truck and serviced from our storage tank with a booster truck. This year we were slowed down by having only two boosters, each having to supply two sprinklers. But next year the plan is to furnish each district with a sprinkler and a booster. There was never any idea of making this a permanent operation. It is nothing more than a stop-gap measure until we can put down paving. Two assessment paving programs, each of 80 blocks, have been completed and a third of 110 blocks is beginning.

Proved Inexpensive

As for the cost of this emergency operation dust-killer, it wasn't too great considering the relief it brought. We probably figured our cost a little different than would be the usual case. The city was already running its water sprinklers, so had the expense of equipment, labor and water. Therefore, the actual outlay for the emulsion treatment was not more than the cost of the emulsion and the equipment and labor to handle it. A complete treatment—blading, rolling and asphalt sprinkling 4 to 6 times—cost about 4 cents per square yard.

We think it was, and still is, money well spent. In addition to taking a big percentage of our people out of the dust, it has saved us many dollars in blading cost. When we start treating a street with asphalt spray, blading stops until the street has to be torn up, reshaped and shot again. We have found that most residential streets need very little reworking. Mainly only our thoroughfares need it and we're hoping to get most of them paved soon.

Keen Interest Shown

Surprising interest has been shown in the process. We have received letters from throughout Texas and some from other states requesting information.

It has been both encouraging and amusing to find that some of our streets, after a few treatments, look enough like penetration pavement to fool many people. There is one property appraiser who frequently calls my office to be sure whether he's putting a value on property on a paved street or one thoroughly doused with emulsion.

And there was a lady who called to say she was very disappointed in the paving we put down in front of her house. She said it didn't last but three months. Upon investigation, we found the lady's street has never been paved—only treated with emulsified asphalt.

★ Two examples of residential streets following one emulsion treatment via the sprinkler. Foreground in upper scene shows untreated section of roadway

Western Road Test Project Planned

The Highway Research Board of the National Research Council in Washington, D.C., announced that negotiations have been completed with ten State highway departments of the Western Association of State Highway Officials whereby the Board will conduct a full-scale test of bituminous pavement in southeastern Idaho.

Cooperating in the test are the highway departments of California, Colorado, Idaho, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming, the Bureau of Public Roads, and the petroleum industry. Assurance has been given that test trucks will be furnished by truck manufacturers of the Automobile Manufacturers Association, provided they do not become committed to a greatly increased defense production effort.

The test road will consist of two enclosed loops, each with two 1900-foot straightaways of test pavements. The design of the pavements in the two loops will be identical.

Controlled test traffic consisting of two different prevailing weights of single-axle trucks will be used on one loop, and two different prevailing weights of tandem-axle trucks will be used on the other. Pavement on the test sections will vary in thickness from 6 to 22 inches, and the relative effects of the different types of test trucks on all sections will be determined and the results utilized in future design. Careful records of the cost of maintaining the various sections will be kept as an aid in determining the "real cost" of each highway type.

Plans approved by the Western Association of State Highway Officials have been submitted to contractors in the Western States for construction cost estimates. Negotiations with the low bidder will be completed within the next few weeks. Construction will be started early next spring, and the pavement should be completed early in August. Shortly thereafter, controlled test traffic will be started on the test sections and will be operated until stopped by winter weather. The test will be started again in the spring of 1953 and continued for about three more months.

Periodic reports of the progress of this test will be released by the Highway Research Board.

Heated Seal Chips

AMONG IDEAS BEING TRIED IN WISCONSIN'S BITUMINOUS PROGRAM

By J. R. Schultz

Engineer—Construction, Wisconsin Highway Commission, Madison

IN Wisconsin during a number of years, we have passed through a cycle of experimental bituminous mixtures and methods and returned pretty much to the point of departure. Some of the highlights are discussed herewith:

1. **Maintenance.** Beginning from road mixes utilizing local aggregates processed to meet a rather tolerant 1-inch minus gradation specification and combined with SC oils or MC cutbacks, the department has tried a coarse aggregate traveling plant mix keyed with finer aggregate and sealed, then returned to the road mix mat. The currently used aggregate specification requires that all material pass a 1-inch sieve with 65%-85% retained on a No. 4 sieve. The resulting slightly open-textured mat receives a light sand seal during the year of construction, followed with a chip or pea-gravel seal a year or two later.

During the past year we tried something new (for us) in seal coating which, although in all probability will not become standard practice, appears to have merit on roads where severe traffic conditions make conventional methods questionable of success and justify higher costs. The seal coat was placed on a slightly raveled and patched bituminous concrete mat carrying some 10,000 vehicles per day (30% trucks) and consisted of an 85-100 penetration asphalt cement applied at 0.30 to 0.35 gal. per sq. yd. at ± 325° F., covered with ⅜"—No. 10 crushed limestone chips spread hot (350-400° F.) at the rate of approximately 35 lb. per sq. yd. The chips were rolled while still hot and traffic was excluded from the road until the aggregate had cooled. The aggregates for the job were heated in a standard drier used in hot-mix bituminous work and spread in the conventional manner with mechanical spreaders attached to the backs of trucks. The trucks were worked in echelon to cover the entire width of pavement as quickly as possible to preclude cooling before rolling.

It might also be mentioned that a trend toward the purchase and use of aggregate drying, plant mixing, and machine spreading equipment seems to be developing in the counties of the state. Continued wet and cool summers may accelerate this trend in the future.

2. **Construction Types.** In the field of construction recent years have seen considerable development in the use of bituminous materials and mixtures through the impetus of the necessity for rehabilitating, salvaging, and modernizing worn out and inadequate rigid and flexible pavements. The results obtained and experienced gained from this rehabilitation work indicated the adaptability of this type of construction to new work, and we have greatly extended its use.

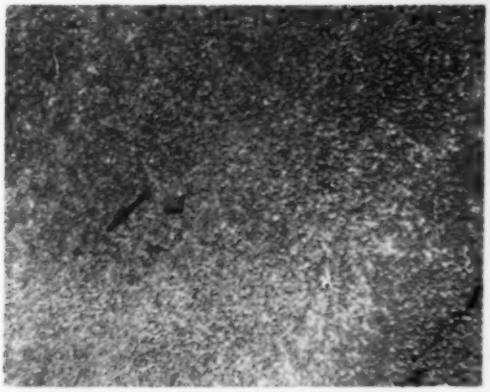
Generally speaking, we are using three primary types of mixtures or surfaces on construction projects, namely, a road-mix type, a "single-aggregate" hot plant-mix type, and a closely controlled hot plant-mix or "bituminous concrete." With the latter may be included the "sheet asphalt" type, which is often used in the larger urban communities. The use of the specific type is generally dictated by traffic densities or weights in the categories of light, medium, or heavy.

The bituminous component of the road mixes is usually the cutbacks MC-3 or 4 or the slow-curing liquid asphalts SC-3 or 4. Asphalt cement in the penetration ranges 85-100 or 100-120 is most generally used in the single-aggregate hot mixes, while in the bituminous concretes, asphalt cements ranging from 60-70 penetration in sheet asphalts to 70-85 and 85-100 in the coarser grained mixtures are being used. It may be interesting to note that in Wisconsin the pendulum has swung from side to side in the matter of grade of asphalt used in the hot plant mixtures through several years, but the inclination today is toward the lower penetrations indicated.

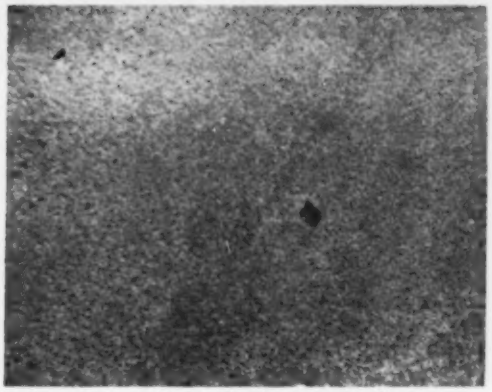
3. **Specifications.** The newest specifications incorporated into a 1951 edition of Wisconsin's Standard Specifications are fairly consistent with specifications adopted by the A.A.S.H.O. or recommended by other authorities in construction procedures and plant and equipment requirements. But our specifications differ in certain particulars to aggregate gradations and design requirements in consideration of local materials or conditions. These specifications, incidentally, are still in the state of development and will undoubtedly be modified as new factors present themselves in the test of field use.

Four master ranges of aggregate

★ Heated chips being applied—note tarpaulin cover on truck



★ How seal cover appeared immediately after rolling



★ Same surface as it looked after four days of traffic

gradation have been adopted for use in all types of mixtures with nominal maximum sizes of 1 inch, ¾ inch, ½ inch, and No. 4 mesh, and corresponding passing No. 200 mesh percentage fractions of 3-12, 5-12, 5-12, and 5-20. The No. 1 gradation (1-inch minus) is used for bituminous concrete binder courses; the No. 2 gradation (¾-inch minus) for road mixes, single aggregate, and bituminous concrete surface mixtures in rural areas; the No. 3 for surface courses in all three types when at least 50% fractured particles cannot be obtained in the aggregate production process, for courses placed in less than 1¼ inch thickness, and for urban pavements; and No. 4 for sheet asphalt surface courses.

Within the master gradation ranges, a "job-mix" gradation is established in the laboratory from representative samples of proposed job aggregates, to which gradation the contractor must adhere within specified tolerance points. These tolerances from the job-mix become more restrictive in the higher-type mixtures.

The percentage of bitumen used in the job-mix is also established in the laboratory from information obtained from a modified Hubbard-Field stability and density test made with the job aggregates.

4. **Field Control.** All types of bituminous mixtures receive close and careful observation and checking in the field from the proportioning and mixing process through the hauling, placing, and rolling operations.

A field laboratory is established at each production plant to check aggregate and mixture gradations, temperatures, bitumen contents, daily production, etc. and constant inspection is maintained on the road to obtain optimum results in the matter of density, surface texture, and riding qualities, as well as to check the operation for conformance with specifications. In addition to the field checking, daily samples of mixture are submitted to the laboratory for verification of gradation and bitumen content, and frequent road samples of compacted mixture are submitted for density determinations.

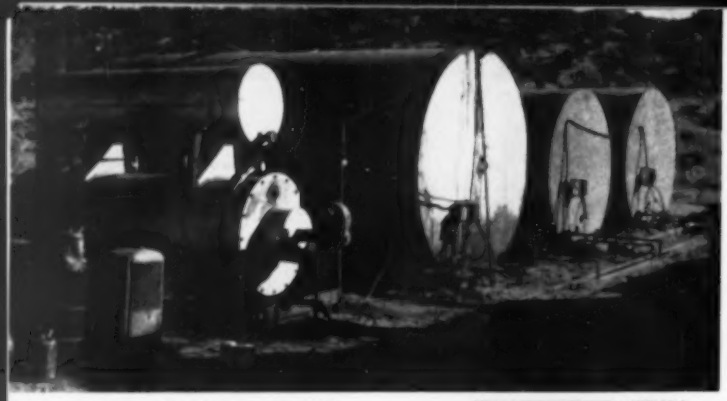
5. **Research.** We have not in the past engaged in extensive test or experiment work which could be dignified by the title of "research," but we have done considerable laboratory and field work relative to establishing the present aggregate gradation limits, bitumen contents, and mixture design techniques and requirements. Some work has also been done in comparing design tests used by other states, particularly the Hubbard-Field and Marshall. But no conclusions have been arrived at other than the fact that much still remains to be done to develop a completely satisfactory mixture design procedure and test encompassing such factors as aggregate maximum size and gradation, bitumen content, grade of bitumen, stability, density, and surface texture.

It is hoped that more research work may be accomplished in the future, not only to develop the best design method for local conditions, but also to make the most effective use of local aggregates and to obtain better correlation between laboratory and field results.

Research in Virginia

A bulletin entitled "Highway Research in Virginia" is available free to those interested in the work of the Virginia Council of Highway Investigation and Research, Thornton Hall, University of Virginia, Charlottesville, Va. Tilton E. Shelburne is director of research of this organization, representing the technical colleges and the highway department of the state. The Council's program covers projects in soils, aerial mapping, concrete design, bituminous road methods, signing marking and furtherance of graduate study in highway engineering.

★ Wisconsin methods include dragging and rolling with steel rollers



★ Hot oil heater in the foreground with the emergency light plant; piping hookup; and electric controls for asphalt storage

★ (Left): "Chic Sale" is contractor's solution to dust problem. One such house with connecting pipe provided for each of the two diesel units on the hot-mix plant, each house containing a fan for blowing relatively clean air to the engine carburetor

★ (Right): Two recording pyrometer units such as this were used to control hot-mix temperatures—one at drier outlet and one at spout over the trucks

(Continued from page 71)

very satisfactory.

Another feature of the project is the elimination of small open bridges in favor of large reinforced concrete box culverts. The 7.9-mile project required 120 structures, including 80 concrete pipe culverts up to 48-in. diameter, and 40 boxes. A high element of cost in modern 4-lane construction involving heavy fills is the great length of such structures. Waterway structures for the project averaged over 150 ft. long, reaching a maximum length of 242 ft. The project included one quadruple 10' x 5' box, one triple 8' x 6', and one double 10' x 12'. Large culverts in lieu of bridges reduced first cost, expedited the grading and eliminated all roadway restriction, thus contributing to safety. Air entrained, alkali resistant portland cement concrete was used for all structures.

J. H. Morgan was the project engineer for the New Mexico State Highway Department on this project.

Van Cleve Heads N. Y. Bituminous Group

The recent annual convention of the New York State Bituminous Concrete Producers Association held at the Roosevelt Hotel in New York attracted an attendance of 231 members and guests.

William H. Peckham was General Chairman. Daniel F. MacNamee Chairman on Arrangements, Len N. Marquoit Chairman on Reception and Credentials. Representatives of the New York State Department of Public Works, Thruway Authority, New York State Flood Control and United States Bureau of Public Roads were present.

Elected officers of the Association for the ensuing year: H. M. Van Cleve, Syracuse, President; James L. Holden, Batavia, Vice President; Avery L. Bullen, Fort Edward, Treasurer; Gus Rayner, Albany, Executive Secretary.

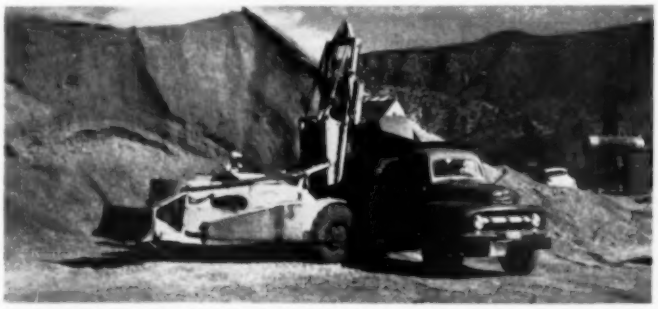
Elected directors for two years: William H. Peckham, White Plains; Arthur J. Hendrickson, Cederhurst; Reilly Hayes, Utica; George M. Schaffer, Rochester and Robert U. Blades, Hornell.

Buck and Gray Head Asphalt Institute

At their annual meeting in December the Board of Directors of the Asphalt Institute, representing the major part of the petroleum asphalt production industry of the United States and Canada, elected Harold J. Buck, General Sales Manager, of American Liberty Oil Company, Dallas, Texas, Chairman of the Executive Committee, for the coming year and re-elected Bernard E. Gray, President.

Vice Presidents elected for the five U. S. geographical divisions of the Institute were the following: John D. Mohler, Jr., Pan-Am Southern Corporation, for Division I; D. H. Jenks, Jr., Ashland Oil & Refining Company for Division II; H. G. Nevitt, Socony-Vacuum Oil Company, Inc., for Division III; M. O. Huntress, Allied Materials Corporation for Division IV; Raymond Harsch, Shell Oil Company, San Francisco, for Division V. These Vice Presidents, together with Messrs. Buck and Gray and Frank R. Field, Esso Standard Oil Company, ex-officio as retiring Chairman, constitute the Executive Committee for the coming year.

Herbert Spencer was re-elected Secretary of the Institute, George R. Christie, Socony-Vacuum Oil Company, Inc., was re-elected Treasurer and John N. Smith, also of Socony-Vacuum Oil Company, Inc., Assistant Treas.



★ Stockpiled base material was handled by this loader and also a truck crane with clamshell

What the States Are Doing to Develop

Better Bituminous Roads

III—Continuing a series of state-by-state summaries highlighting developments in bituminous road design, construction and maintenance

Kentucky

By A. O. Neiser, Director of Design, Kentucky Department of Highways, Frankfort.

OUR design for high type flexible pavements remains about the same as it has been for the past five or six years which may be briefly described as one or more courses of waterbound macadams topped with 1½-in. plant mix binder and 1½-in. plant mix surface. This design has been very successful in withstanding the present day heavy traffic and has only one shortcoming which we hope to remedy, and that is our difficulty in obtaining good riding surfaces. Irregularities in base course construction caused by high tonnage production and insufficient inspection cannot be satisfactorily corrected in the binder and surface courses with bituminous pavers as now built. It is our intention to find some means of correcting this fault by experimenting with leveling courses, better checking templates and the use of motor graders with a road mix leveling course.

The design for flexible pavement for medium traffic is about the same as for high type, except that only one course of waterbound is constructed, and frequently the bituminous surface is reduced to 1½ in. of road mix or plant mix material. We have not found a solution for better "low cost" surfacing on light traffic roads, for the simple reason that light traffic also means occasional truck traffic.

We have recently amended our Class I Bituminous Concrete Specification to include a Type C surface course which includes mineral filler, 3%-7% passing the No. 200 sieve. This was done in an endeavor to obtain more density and better wearing surfaces. The Type C surface course is to be used primarily on city streets.

Each year we have a large maintenance resurfacing program in which the surfacing design varies with the type of road and its condition. All types of resurfacing are used, such as plant mix binder and surface courses, road mix, penetration, and seal coats. This past year we have increased the use of penetration resurfacing in order to get a better experience with this type of construction.

We are having difficulty in determining the proper type of bituminous material to use in seal coats, chiefly because of the varying quality of aggregate, the season of the year constructed, and construction methods used. In an attempt to eliminate some of these variable factors, and concentrate on determining the proper bituminous material, we are experimenting with a contract seal coat project, which calls for the use of five kinds of bituminous material on a 15-mile section of road.

Existing pavements, both concrete and flexible types, have been salvaged, strengthened and widened with bitu-

★ Kentucky. Spreading plant-mixed material for binder course, to iron out irregularities in preparation for machine-laying surface course. Note end plates on blade. Paris-Millersburg road. Galion grader

★ Kentucky 1951 program. Placing dense-graded asphaltic concrete surface course with sandstone aggregate having ⅜-in. maximum size. Jackson-Salyersville road. Adnun spreader

★ One of asphalt plants as set for 1951 project, Kentucky

minous concrete binder and surface courses. Our policy is to widen cement concrete pavements with cement concrete base, and bituminous pavements with bituminous concrete base. In either case the overall treatment is usually bituminous concrete binder and surface.

The Department has undertaken during this past year a large-scale experimental project covering the use of sandstone aggregate in plant mix surfaces.

Mississippi

By H. O. Thompson, Testing Engineer, Mississippi State Highway Department, Jackson.

A considerable mileage of bituminous surface treatment is being constructed, using standard practice.

New specifications provide for the correction of deficiencies in gradation of local sand-clay used as the binder in base courses (–10 material). Should a local material be deficient in the amount retained on No. 40 and No. 60 sieves, it is common practice in this state to add coarse sand (material passing No. 10 and retained No. 60 sieve) in the same mixing operation with the coarse stabilizer (material passing 1 ½ sieve and retained No. 10 sieve).

This procedure naturally provides a better graded base course material that can be more readily compacted and thereby yield higher densities. These properties naturally improve the ultimate bearing value of the base course material.

District of Columbia

By Norman G. Smith, Assistant Engineer of Materials, Department of Highways, District of Columbia, Washington. H. F. Clemmer is Engineer of Materials.

The District of Columbia in cooperation with the Bureau of Public Roads has constructed an experimental section of bituminous paving incorporating various forms of rubber in the mix. There will be sections of sheet and sand asphalt incorporating natural, synthetic, reclaimed, and plasticized rubber as additives in addition to control sections of the two types of surfacing. The binder course will conform to the current D.C. specifications and rubber will not be included.

This experiment is in connection with the resurfacing of an old concrete pavement on Michigan Avenue, one of the streets having a relatively high density of traffic. Rubber for this experimental project is being furnished by the Firestone Tire and Rubber Company and the United States Rubber Company. The Highway Construction Company has the contract for this work.

Washington

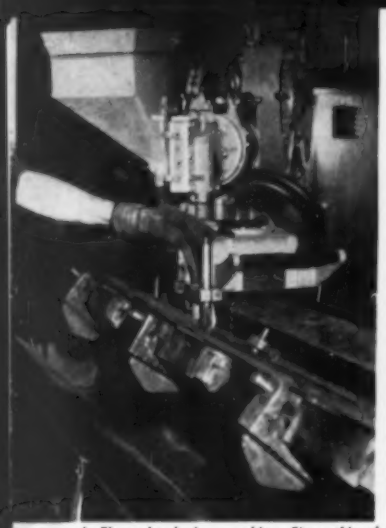
By Bailey Tremper, Materials and Research Engineer, Washington Department of Highways, Olympia.

In this department we feel that the adoption of triaxial methods of testing soils, bases and bituminous mixtures is noteworthy with respect to results obtained. Our laboratory is equipped with the Triaxial Institute mechanical compactor, the Hveem Stabilometer, the Hveem Cohesiometer and swell pressure devices as described by Hveem and Carmany in Proceedings, Highway Research Board, 1948.

After traffic counts have been made and estimated for the ensuing 10-year period, the laboratory test data enable us to proceed with a design of roadway section that takes into account each component of the road, subgrade soil, sub-base, base and wearing surface. The formulas used in computing the required thickness of cover over each component are similar to those developed by Hveem and Carmany but have been modified slightly to agree better with conditions in Washington state. Certain details of the testing procedure have also been modified slightly in keeping with differences in construction procedure.

Although the true value of our present testing and design methods will not be established until after several years of experience, we are confident that economies in construction and maintenance will result. This belief is based on the behavior of existing roads from which samples have been taken and subjected to our present test procedure. These investigations have exposed weaknesses in roads that are suffering damage from traffic and have confirmed the adequacy of design and construction where traffic is being carried without visible distress.

★ Kentucky. Laying binder course containing a sandstone aggregate, in an all sandstone aggregate bituminous pavement. Jackson-Salyersville road



★ Flame hardening machine. Since this photo was taken, the unit has been changed to include a double flame head on two carriages to speed up production. (Right): Showing operation of Union Melt automatic welder, employing the submerged arc process by which the reinforcing strips are attached.

★ Showing penetration of weld by the melt machine

Flame Hardening Saves Plow and Wing Blade Steel

AS a means of getting more service out of blade steel, the welding process is used systematically by the equipment division of the New Hampshire public works and highway department.

Soft steel plate of 45 carbon content is purchased in approximately 300-ton lots and cut to proper sizes in cutting-edge lengths. Machine finished 2½-in. wide strips of the same thickness are also purchased, or salvaged from worn blades, for welding onto both edges of the blade to provide double blade thickness.

This material is stored in a warehouse until ready for fabrication and then brought to the welding department, where punching of holes is done by punch and shear methods. The blades are handled from this point by a mono-rail to an automatic welder producing 22 in. of welding per minute and giving ¼ in. penetration. Here the two wearing strips are attached through this process without manual labor and again picked up on a mono-rail and handled to the hardening unit where two open flames through multiple head welders produce a heat of 1300°F. The blades are cooled in the same process by water spray that follows the multiple heads at approximately 20 in. per minute.

Completion of this process produces a blade of double thickness at edges with a 500 to 550 Brinell hardness and a soft core where the blade attaches to a snow plow or other unit.

The saving in cost from the use of the machine described has been considerable. As an illustration, hand welding of a 9-ft. blade required approximately one hour; welding of the same blade by the process now in use takes 10 minutes for the complete operation including the clamping of the strip to the blade and removal of the finished product.

★ Blade display in office of New Hampshire Department of Public Works and Highways. Top to bottom: wearing strip; blade plate; skewed cutting edge (Ross plow); straight cutting edge (Good Roads plow); leaning blade is for one-way plow (Frink)

ASTM Standards on Bituminous Materials 1951 Edition Issued

The compilation entitled "Standards on Bituminous Materials for Highway Construction, Waterproofing, and Roofing—1951" was issued recently by the American Society for Testing Materials. It covers standard and tentative specifications, test methods, recommended practices, and a definition of terms pertaining to bituminous materials used in the road building, waterproofing and roofing fields. Sponsored jointly by ASTM Committee D-4 on road and paving materials and Committee D-8 on bituminous waterproofing materials, this booklet includes also standards covering creosote materials under the jurisdiction of Committee D-7 on Wood which are of direct interest to the highway construction field. Some 98 standards are covered in the 344 pages. Price to ASTM members, $2.50, to others, $3.25. Address the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

Pneumapower

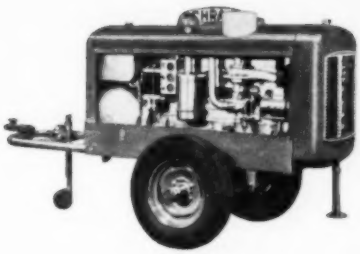
Air Compressor

compact

lightweight

low in cost

Pneuma-power (nu'ma-pou'er), n. 1. Air compressor that is compact, lightweight, low in cost, recommended for operating a heavy duty Rock Drill, or two heavy duty breakers, clay spades, trench diggers



Pneumapower 105 . . . the most compact, lightweight 105 cu. ft. air compressor built. It is easily towed by car or truck and the skidded unit fits into one corner of your truck, leaving valuable space for other items . . . more practical than the cumbersome Power Take-Off type.

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Pneumapower 60 likewise offers weight saving and the same advantages as the 105, with an actual air capacity of 60 cu. ft.

Pneumapower 20 / ***Pneumapower 35*** — **Each a one** man outfit that can easily be moved about and provides air for Paint Spraying, Road Marking, Grease Guns, Driving Stakes, Tire Service Work, etc.

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SCHRAMM AIR COMPRESSORS

Equipment and Materials for Engineers and Contractors

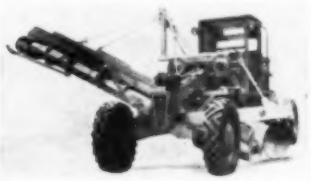
Scraper

A new scraper, announced by Caterpillar Tractor Co., has over 40 per cent more struck capacity than previous "Cat" models and is designed to increase earth-throwing production when used with D8 tractor power. Struck capacity of 21.2 cu. yd. can be increased to 25.5 cu. yd. with the addition of top extensions or sideboards. Likewise, heaped capacity is 27 cu. yd., or 31 cu. yd. with the available sideboards. The scraper moves dirt with the aid of a hard surfaced, reversible cutting edge. Material is carried in a flat, double-bottom bowl of high tensile steel. Operation is by means of a "Cat" cable control unit, which can be mounted on the rear of the tractor to provide for positive loading and ejection. Tapered roller bearings are installed at each axle. The scraper uses two 24.00—29 front tires and two 27.00—33 rear tires, all four of 24-ply rating. When loaded, the scraper distributes 60 percent of the weight on the rear tires. Shipping weight of the u it is 35,100 lb. Caterpillar Tractor Co., Peoria 8, Ill.

"Cat" No. 90 Scraper

Elevating Grader Attachment

A new elevating grader attachment (the "Elegrader") announced by Williams & Reisser Co., has a hinged carrier to facilitate movement from job to job the attachment is designed to work on Adams Models 550 and 610 motor graders. The exclusive hinged carrier design rules out time-taking and troublesome dismantling to allow highway travel, and clearance is no problem for oncoming traffic. The Elegrader has been carefully designed to permit maximum visibility for the operator both in normal operating position or with the carrier raised to traveling position. Less than fifteen minutes is required to raise the hinged car-



The Elegrader—New Elevating Grader Attachment

rier to traveling position, and when this has been done, the Elegrader has the same center of gravity as the motor grader alone. The carrier is equipped with a 36 in. trough type belt which has equal capacity to a 48 in. conventional flat type belt. All troughing rollers are mounted on self-lubricated, permanently sealed ball bearings which do not require any servicing, and all other moving parts are mounted on either ball or roller bearings. Another major feature is ease of mounting the attachment to the motor grader. No welding, cutting or major alterations to the motor grader are necessary. Precision made interlocking steel wedge plates reinforce the hinge on the carrier, assuring a rigid, solid stiffness in either working or traveling position. In recent field tests the Elegrader is stated to have graded 18 miles of road in 176 hours of operation, and it was estimated that 180,000 cu. yd. were moved on this job. William & Reisser Co., P. O. Box 1126, 23rd and Hickory Sts., Omaha 1, Neb.

Road Graders

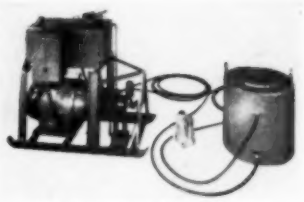
A new series of road graders known as the Models 42, single drive and 44 tandem drive placed in production by the Meili-Blumberg Corporation, is stated to incorporate unusual design features. This series of graders in the 40 h.p. class weigh up to 15,000 lb. and carry 10 ft. and 12 ft. blade. These units have been designed to fill the gap between the light 30 h.p. maintenance grader and the high priced heavy duty machines. Most unique general feature of these units is that they can be purchased to fit particular job require-

New Meili-Blumberg Graders

ments, the price depending upon the feature selected. For example, the graders can be purchased with single or tandem drive; gasoline or diesel engine; with or without a power circle turn, leaning front wheels, blade side shift, front end loader, scarifier—plus a wide selection of tire sizes both front and rear. The user can thus select the features consistent with his job requirements, or his budget limitations. Mechanical features include hydraulic control; chain driven tandem with extra heavy axles; 5 travel speeds forward and 1 reverse; 9 lb. ft. tubular frame; 86 in. blade base; 19 in. front axle clearance; 7350 lb. blade pressure. Meili-Blumberg Corporation, New Holstein, Wis.

Hydraulic Jack

What is said to be the world's largest tonnage hydraulic jack of its type is illustrated. It is a Simplex "Jenny" centerhole puller of 600 tons capacity made by Templeton, Kenly & Co., Chicago. Operated by a 10 h.p. motor, it is double-acting for use in large electric plants. Weight of ram: 1,750 lb. Two hand pumps are incorporated. After desired tonnage is run up with motor, extra tonnage can be added gradually with hand pumps. Outside diameter is 22 in. Height,

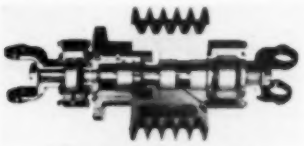


600 Ton Jenny and Standard Jenny

21 in. 6½ in. travel is provided in 7¾ in. center hole. The "Jenny" center-hole principle eliminates torque. This jack pushes or pulls in a straight line, vertically or horizontally. Size comparison is provided by a standard Jenny shown to the left of its big brother.

Power Take-Off

A new "packaged" heavy duty power take-off to fit all standard motor trucks has been announced by Davey Compressor Co. Known as the Davey P-80, the new take-off is guaranteed to transmit full engine power to the driving of heavy duty truck-mounted equipment. It con-



Davey P-80 Power Take-Off

tains 12 less parts than its predecessor model, "Davey 75," and is 25 lb. lighter. Another new feature is a vacuum shift control which is offered as optional equipment. The take-off unit itself is identical for all trucks. Carefully engineered mounting parts for individual truck makes are maintained in stock at all times. The P-80 is 18 in. long and weighs 140 lb. Truck Equipment Division, Davey Compressor Co., Kent, O.

High Intensity Lamp

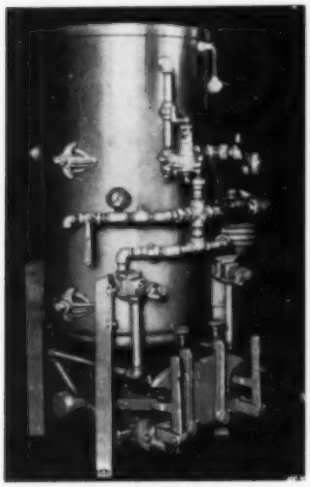
A tiny new portable fluorescent lamp producing intense but cool illumination of up to 450 foot candles of light is now offered. Containing two 4-watt fluorescent tubes and all components within a 2 in. by 6 in. drawn shade, the general utility lamp emits a flood of cool, diffuse light. The jacknife support bracket containing three adjustable links, each 3 in. long, may be removed from the cast base for permanent installation to a desk, table,

General Utility Lamp. Model 16-7S

bench, or machine. Swivel joints are provided at each joint as well as in the head and base to allow adjustment to any position. The lamps are rated at 7500 hours average life which normally represents over 3 years between lamp replacement. F. P. Hayden, Sales Manager, Stocker & Yale, Inc., Marblehead, Mass.

Sand Blast Machine

A new model sand blast generator has been added to the line of Ruemelin Manufacturing Co. The new model is a continuous double compartment unit. This type of generator is used for continuous operation of one or two nozzles without interruption or stoppage when refilling



Continuous Operating Double Compartment Blast Generator

the tank with abrasive. A special arrangement of filler valve permits the upper chamber to be loaded with sand while the lower compartment is operating and under pressure. This machine is designed for jobs requiring continuous production. Due to the height, loading by means of clam shell bucket or abrasive elevator is recommended. Built in sizes of 800 to 10,000 lb. sand capacity. Ruemelin Manufacturing Co., 3863 N. Palmer St., Milwaukee 12, Wis.

Scraper

A new McGee scraper, announced by The Tractor Sales Co., has cradle action and hydraulic control of scraping angle. The operator with but a touch of the control valve adjusts the tilt of the scraper. The tilt can be changed for scraping, backfilling or scarifying . . . all without dismounting from the tractor. With a bucket capacity of approximately ⅜ yd. and a cutting and back-filling

McGee Scraper

New chloride spreader

blade 5 ft. 6 in. wide, the total weight of the McGee scraper is 450 lbs. The Tractor Sales Corp., 1409 Santa Fe Ave., Los Angeles, Calif.

New Spreader for Calcium Chloride

Dow Chemical Company engineers have recently completed development of a tail gate spreader designed specifically for applying calcium chloride pellets and flake to roads for dust-proofing and ice control. It will be manufactured by The Baughman Manufacturing Company of Jerseyville, Illinois. The spreader may be installed on any size dump truck.

In their research, the Dow engineers were looking for a spreader which would meet all the following requirements: One man operation, for safety and economy; Uniform spread at all truck speeds; Adaptability to any type of dump truck, without requiring special trucks or special hitches; Light weight, for easy installation; Rugged construction; and Simplicity, for low cost mass manufacture.

The spreader finally developed weighs only 380 lb. and can be installed in about 30 min., without any welding, cutting, or bolting.

Uniformity of spread is accomplished by driving the spreader roll through an easily installed linkage with the wheel of the truck. As the truck speed increases or decreases the spreader roll goes faster or slower and delivers the same material per square yard. No material can leak through when the spreader is shut off.

By shifting a gear, the operator can double the rate of application where extra material is required on hills and curves; through chains and sprockets a wide variation in application is possible.

Additional information on the new spreader, prices, and delivery dates may be obtained from the Baughman Manufacturing Company, Jerseyville, Illinois.

Earth Boring Machine

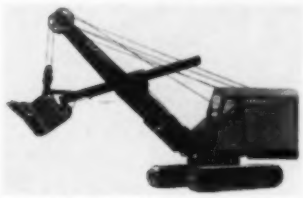
A boring machine, now in production by California Welding and Blacksmith Shop, drills 10 in. to 72 in. holes 200 ft. deep, and is designed for drilling construction footing columns, soil testing, well drilling and mineral exploration. The 32 ft. collapsible derrick has a 20-ton capacity in drilling position. The ring gear drive has a heavy duty friction clutch with a capacity of 9 h.p. at 100 r.p.m. The hoist consists of two drums

Calweld Model 150-A Trailer Mounted Boring Machine, delivered to Ministry of Agriculture, Athens, Greece

with a pull of 2000 lb. at a line speed of 175 ft. per minute. The drivers are of finished roller chain with steel sprockets. The motor is a 100 h.p. stationary-type Ford Mercury gasoline engine with a heavy duty radiator and extra large oil pan. For a complete range of drilling speeds, the motor is equipped with a 4-speed transmission. The bucket is fabricated from ⅝ in. rolled plate and has a bottom of cast steel. A cast steel box on top of the bucket secures the kelly bar. The standard kelly bar, made of heat treated alloy steel, 3 in. square, is 22 ft. long. California Welding and Blacksmith Shop, 7222 E. Slauson Ave., Los Angeles 22, Calif.

¾ Cu. Yd. Excavator

A new ¾ cu. yd. excavator and material handler (the Model 320) is now in production by The General Excavator Co. The Model 320 is fully convertible to shovel, clamshell, crane, pile driver, dragline, and hoe work, in the field with a minimum of effort. The standard shovel boom length is 18 ft. 8 in., with a dipper handle of 15 ft. 3 in. effective length. Standard crane boom length is 35 ft. Standard length of crawler is 11 ft., 4 in., with 20 in., 25 in., or 30 in. treads available. This is a manually controlled machine. Twin disc clutches are used for swing and travel motions, for raising and lowering the boom and for shovel retract. Contracting band clutches are used on the hoist drums. Independent travel is optional. The crawler base, machinery side frames and the deck, are made of castings and rolled structural steel shapes, used separately or in combination to obtain the maximum advantage of each type of material and construction. Machinery mounted on the superstructure is placed well back on the deck, thus giving an unusual stability and increased lifting capacity, with a minimum amount of dead counterweight necessary. Ground bearing pressures are low. The General Excavator Co., Marion, O.

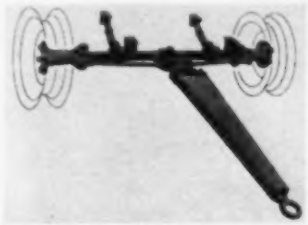


Model 320, ¾ Cu. Yd. Excavator

Front Axle Assembly

A new front axle assembly in the Caravan line of 4-wheel running gear announced by the United Manufacturing Co., features a turning radius as much as 45°, depending upon track width and spring location. In addition, greater stability is obtained by heavier overall construction and incorporation of extra-heavy 1¾-in. center arm stops.

These automotive type assemblies have capacities ranging from 10,000 to 12,000 lb., and are recommended by the manufacturer for applications where maximum stability is required such as handling air compressors, heavy-duty generators, pumps, tar kettles, concrete mixers, military field units and other mobile equipment. Inside wheel turning angle of this new axle is 35 to 45°, depending upon model. This wide angle decreases the turning radius for the same wheel base and track, and as a result increases maneuverability. Increased wheel turning angle also increases the draw bar turning angle and reduces the possibility of jack-knifing. United Manufacturing Co., 51 W. Interstate St., Bedford, O.



Model 2-A Caravan Axle

Cutting Head for Earth Drill

A new cutting head for welding onto any continuous helix type earth drill or post hole auger is now in production by

Pengo Cutting Head

Petersen Engineering Co. The new unit is of twin helix design. It replaces the conventional cutting head by means of directly welding to the bottom of any continuous helix auger. The cutting head is said to work favorably under any kind of ground conditions, but the main features claimed for it are that it makes it possible to bore holes under adverse conditions with machines using the continuous helix auger, where formerly only the heavier type machines were capable of boring. Pengo cutting heads are available in eight sizes ranging from 10 in. to 24 in. in diameter. Petersen Engineering Co., Santa Clara, Calif.

Rock-Type Tire

A new rock-type tire designed particularly for graders and tractors operating where there is considerable rock or under especially tough conditions has been announced by The B. F. Goodrich Co. Made for semi-drop center rims, the tire fits rim size 800 T, has a cross section 13.2 in. wide with an outside diameter of 50.8 in., maximum rated load of 6600 lb. when inflated to 50 pounds pressure, and make 426 revolutions per mile, all of the data being based on a maximum speed of 25 miles an hour. B. F. Goodrich Co., Akron, O.

Rock Type Grader, Tractor Tire

Wire Rope Lubricant

A new wire rope lubricant—Texaco Crater A—which because of its unusual penetration and adhesion properties will permit application to wet wire rope has been marketed by The Texas Company after extensive highly satisfactory field tests. The new product, according to the company, represents an important improvement over the product previously marketed under the same name. The new formulation achieves greatly improved wettability while retaining all the desirable characteristics of previous Texaco Crater A. Field tests on cables in use on dredges and cranes returned performance data indicating that the compound is especially valuable for use in severe weather conditions, where the wire rope is wet when the lubricant is applied, or where cable is subjected to abnormal water conditions in use. Texaco Crater A will penetrate and adhere to dripping wet wire rope. It is a thin liquid product which is applied without heating. The new product remains pliable under a wide range of atmospheric condition. It will not drip or evaporate in hot weather. In cold weather it does not harden or chip. The Texas Co., 135 East 42nd St., New York, N. Y.

Mud Guard for Dump Truck

A new Cardinal Mud guard for dump trucks, announced by Velvac, Inc., comes in 35 in. and 40 in. sizes and has reinforced holes molded into the lower corners. A ring can be mounted on each corner which permits the guard to be hooked up for dumping. When the truck is working in a gravel pit or off the highway for any period of time, the guard can be fastened forward under the body of the truck. An installation kit designed by Velvac, Inc., can be used in some cases to provide an automatic pull up when the truck is dumping. Velvac, Inc., 3530 W. Pierce St., Milwaukee 15, Wis.

(*Continued on page 97*)

MANUFACTURERS' LITERATURE

Elevating Grader

A new elevating grader attachment having an unusual feature is described in a circular issued by William & Reiser. The attachment has a hinged carrier to facilitate movement from job to job. The trade name of this unit is "Elegrader" (a contraction of the two words, elevating and grader). It is designed to work on Adams Models 550 and 610 Motor Graders. William & Reisser Co., P. O. Box 1126, 23rd and Hickory Sts., Omaha 1, Neb.

Power Shovel Shock Absorber

How the Greer Accumulator eliminates severe shock and vibration of hydraulically operated bucket loaders, power shovels, and other tracked or rubber-tired equipment is described in a new Bulletin 700 published by Greer Hydraulics, Inc. The Greer Accumulator consists of a steel shell containing a rubber bag precharged with gas. Hydraulic fluid forced into the shell through an oil port compresses the bag. Thus any sudden impact against the hydraulic fluid in the system forces oil into the shell where it it cushioned by the gas in the bag. Greer Hydraulics, Inc., 454 18th St., Brooklyn 15, N. Y.

Spray Nozzles

Up-to-date information on non-clogging spray nozzles for cleaning all kinds of materials, screens, etc., is given in a new 4-page illustrated Folder No. 2386 released by Link-Belt Co., Folder shows installation pictures and how simply the nozzle can be applied. Tables give dimensions of nozzles for pipes of 1 to 3 in. diameter, and the capacity in gallons per minute through orifices of 5/32 to ½ in. diameter at pressures of 20 to 100 lb. per square inch. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.

Chemical Sprayer

The Hanson Brodjet sprayer for the application of chemicals is illustrated and described in a new 12-page catalog. This unit sprays up to a 44 ft. swath on right of way, roadsides, parks and yards. The 1942 model has also been designed so that the same unit will clean machines and buildings. Various features of the sprayer are described in the catalog which also contains sections on pump kits and accessories. Gallonage charts are included: Hanson Chemical & Equipment Co., Beloit, Wis.

Heil Anniversary Book

An interesting, fact-filled anniversary book, "The First Fifty Years," has been issued by The Heil Co., to mark the passing of its golden year. The 24-page book tells a graphic story of achievement, facilities and ability, with more than 60 illustrations. Each of the Heil product lines is represented with pictures of the old and the new, pointing up the significant contributions to progress made in its respective field and its current position in the industry. Present facilities and capabilities for the production of vital equipment for war and peace are depicted with picture spreads showing the range of products which have, or are being, manufactured. The Heil Co., 3000 West Montana St., Milwaukee 1, Wis.

Highway Clearing

A new bulletin issued by Emico describes the use of its rocker shovel in clearing up highway slides. This is a new application for the machine. This heavy-duty crawler-mounted shovel requires a width of only 6 ft. 6 in. Illustrations show the machine on several highway clearing operations. The Eimco Corporation, 634-666 South Fourth West St., Salt Lake City 8, Utah.

Snow Fighting

Useful information on snow fighting is given in a bulletin issued by Walter Motor Truck Co. The bulletin covers the following: Equipment requirements, plan of attack, wide highways and airports, clear down to the pavement, light snows, normal snows, deep snows and special precautions before starting snow clearing. Walter Motor Truck Co., 1001-19 Irving Ave., Ridgewood, L. I., N. Y.

Flintkote Products

Flintkote Industrial Products Digest—a 24-page, pocket-size, illustrated booklet briefly describes many of the standard and specialized products comprising The Flintkote Co.'s products for industry. The Digest is intended to serve as a guide to specific as well as custom formulated asphalt emulsions and cutbacks, asphalt, rubber and resin adhesives, coatings and sealers. The fields of protective coatings, flooring binders and cements, underlayments for decorative floors, sound deadener and insulating compounds, sealers for joints in concrete pavement, packaging specialties, sizes and laminants for fibreboard and many

other items are described. The Flintkote Co., Industrial Products Division, 30 Rockefeller Plaza, New York 20, N. Y.

Hydraulic Jacks

Complete information, including specifications and application data, on hydraulic jacks, is offered in a new Bulletin (No. 51-R) issued by Templeton, Kenly and Co. It contains photographs, detail drawings and tabulated data on hydraulic equipment in capacities of from 10 to 100 tons. Templeton, Kenly and Co., 1020 South Central Ave., Chicago 44, Ill.

Welding, Brazing and Cutting

An illustrated 6-page folder on welding, brazing and cutting steel with torch and arc has been released by All-State Welding Alloys Co., Inc. Contained in it are complete instructions for use, techniques of application and description of the properties of twelve alloys for welding and brazing and one alloy for cutting, particularly developed for use on all types of steel. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Compressed Air Power

A 21-page pamphlet, "Compressed Air Power in Construction," prepared by the Committee on Engineering Education of the Compressed Air and Gas Institute, presents concisely, but comprehensively, the many uses of compressed air in construction: bolting, cement spraying, conveying, demolition, digging, drilling, hoisting, paint spraying, pile driving, pumping, riveting, rock drilling, sawing, tamping, and vibrating concrete. The pamphlet describes and illustrates air-operated tools used in these construction phases and explains how that equipment operates and presents methods for measuring the equipment's performance. Compressed Air and Gas Institute, 1410 Terminal Tower, Cleveland 13, O.

Welding Equipment

A new catalog on Aircomatic equipmatic equipment and wires describes the Aircomatic gun for manual operation, the Aircomatic head for automatic operation and the Aircomatic wires for use with either manual or automatic equipment. Photographs and sketches of the equipment are supplemented by on-the-job illustrations of a few of the many applications. Airco Company International, 33 West 42nd St., New York 18, N. Y.

Self-Propelled Scraper

The new Wooldridge Model TC-S142 Terra Cobra self-propelled scraper is described in an eight-page bulletin (No. TC-707). Operational features and mechanical details are shown in a series of sectional, cutaway and assembly views. The TC-S142 has a heaped capacity of 17.5 cu. yd., and is powered by a 225 h.p. Cummins diesel engine. The new bulletin describes many features pioneered and introduced by Wooldridge. Wooldridge Manufacturing Co., Sunnyvale, Calif.

Nickel Alloy Steel Castings

A 32-page bulletin, "Nickel Alloy Steel Castings in Industry," reports on steel, cast to shape, as a reliable engineering material. Data on properties and applications of cast nickel steels of the constructional grades are classified by industrial fields. Low temperature properties, abrasion resistance, depth hardening and welding are discussed. Advantages and recommended specifications and compositions for typical service applications are given. International Nickel, Dept. EZ, New York 5, N. Y.

Earth Drill

An interesting folder describing the features of the new Calweld earth drill, Model 150 A, has been issued by The California Welding and Blacksmith Shop, Inc., Los Angeles, Calif. Pictures, sketches and diagrams show the operation of this mechanical drilling machine as it digs caisson pier holes, pre-bores concrete piles, drills water wells and cesspools, explores mineral deposits and tests soil conditions. Text gives specifications and explains the various usages of the Calweld earth drill in heavy duty construction, mining and oil field work.

Service Tools for Tractors

A new 16-page bulletin (No. CT-52) by the Owatonna Tool Co., illustrates and describes OTC tools designed for servicing Caterpillar tractors. Hand tools and hydraulically operated pulling tools are presented, with attachments and accessories built especially for use with the versatile OTC power-twin hydraulic puller. Included also are details of the new 30-ton hydraulic ram which is also adapted to standard OTC pullers. Owatonna Tool Co., North 435 Cedar St., Owatonna, Minn.

Emergency Power Plants

A new catalog covering emergency power plants, released by Universal Motor Co., contains specifications for Universal emergency standby light plants with capacities of from 700 to

36,000 watts, in both gasoline and diesel models, air or water cooled units. Four options for starting procedure are listed for each model, manual, electric, remote control, and automatic standby. Universal Motor Co., 454 Universal Drive, Oshkosh, Wis.

Protective Coatings

A new 24-page booklet on Reilly protective coatings for metal surfaces exposed to corrosion, tuberculation and incrustration has been published. Covering hot application enamels, primers and coupling compounds, cold application enamels and bituminous paints, the booklet outlines properties, uses, containers, performance tests and application procedure for coatings; handling, storage and inspection of protected surfaces; plus field notes on application which include quantities of enamel needed for various pipe sizes. Photographs of pipe and other surfaces which have been protected with Reilly enamels illustrate the booklet. Reilly Tar and Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis, Ind.

Soil Compaction

Detailed information, including useful new production data, for figuring work schedules and costs on soil compaction jobs is contained in a new bulletin (No. 621) published by Barco Manufacturing Co., covering the use of the Barco portable gasoline "Rammer" for tamping fill or back-fill in restricted areas. It contains a discussion of the use of "soil compaction" as a means of attaining (1) greater permanence, (2) lower costs, and (3) earlier completion dates on many construction projects. Applications described in the new bulletin include use of high degree soil compaction in construction work on highways, roads, streets, buildings, dams, bridges, airports, landing strips, ordnance proving grounds, pipe lines, utility trenches, parks, and cemeteries. Barco Manufacturing Co., Dept. R-13, 1801 Winnemac Ave., Chicago 40, Ill.

Radial Arm Saws

Its complete line of radial arm saws is described in a 12-page catalog issued by the Delta Power Tool Division. Complete specifications of all four models are given. Special accessories for the radial arm saws, such as moulding cutter head sets, drill press attachment, mortising attachment and dado head set are clearly illustrated. Delta Power Tool Division, Rockwell Maufacturing Co., 600 East Vienna Ave., Milwaukee, Wis.

Welding Design

A 4th addition of its "Manual of Welding Design and Engineering" has been announced by Eutectic Welding Alloys Corporation. Enlarged to 72 pages, the new edition contains 62 new photographs and 132 new drawings together with the very latest data and how-to-do-it articles; profusely illustrated with scores of application drawings; weld diagrams; tables containing latest information on melting temperatures, tensile strengths, corrosion factors, charts, etc. Eutectic Welding Alloys Corporation, Dept. "P," 172nd St., and Northern Blvd., Flushing, New York 58, N. Y.

Maintenance of Small Engines

A 28-page, 4-color service bulletin (Form 30246) "Small Engine Maintenance Guide" has been published by Caterpillar Tractor Co. In the booklet a dealer's serviceman shows how ". . . good maintenance will add many hours of top performance to your engines." Maintenance facts apply to the six smaller sizes of "Cat" diesel engines, marine engines and electric sets. The booklet is first of a series dedicated to proper equipment maintenance. Full discussion is given to cooling, lubricating, air intakes and exhaust and fuel supply systems. Also included are care of starting engines, marine gear and generators, along with cold weather hints and general facts. Caterpillar Tractor Co., Peoria 8, Ill.

Malleable Castings

The heavier weight of malleable castings is the subject of Folder No. 11 of Belle City Malleable Iron Co., Racine, Wis. The folder shows how they are produced in quantity on a mechanized production line and what the procedures are for insuring easy machinability and adherence to blueprint dimensions.

Gate Valves

The complete Kennedy line of iron-body gate valves for municipal water supply systems is described and illustrated in the new Bulletin 106. It covers AWWA specifications, operating mechanism, methods of operation, special features and end connections available . . . plus full dimensional data for sizes 3 in. to 48 in. The Kennedy Valve Mfg. Co., Elmira, N. Y.

Power Shovels

Two catalogs are available on Bay City shovels. One covers the ½ yd. machine, the other the ¾ yd. machine. The machinery assembly of these ma-

chines is illustrated and described. Job pictures showing the machines in intend construction operations are included. Bay City Shovels, Inc., Bay City, Mich.

Vertical Propeller Pumps

A new Bulletin W-314-B2 on vertical propeller pumps for flood control, drainage, irrigation and similar low head services has been announced by Worthington Pump and Machinery Corporation, Harrison, N. J. It contains cross section drawings, dimensions and a discussion of recommended clearances for the pumps. A request on company letterhead will bring you a copy of this bulletin.

Land Clearing Machines

A new two-page catalog has been published on the Bushwacker, a heavy-duty, tractor-mounted machine for low-cost land-clearing operation. A series of on-the-job action photographs illustrates the principle of operation, rate of production and final results at a typical job site. American Steel Dredge Co., Inc., Fort Wayne 1, Ind.

Low-Temperature Metal Treatment

The advantages of low-temperature metal treatment are described in a new 8-page folder by Sub-Zero Products Manufacturing Division. Among the processes covered are low temperature chilling for stabilization of steel, increasing perishable tool life, and shrink-fit assembly. Through repeated cycles of heat and sub-zero chilling, complete stabilization of steel can be attained in a few hours, according to data given in the folder. Perishable tools, given sub-zero treatment, show gains up to 1700% in usable life. In shrink-fit assembly, remarkable savings in time and prevention of spoilage of parts are reported. Two pages of technical data on methods and results of sub-zero chilling of various metals and alloys are also contained in the new folder. Sub-Zero Products Manufacturing Division, Deepfreeze Distributing Corporation, 3928 Reading Road, Cincinnati 29, Ohio.

Wet-Pit Pumps

A new bulletin W-317-B12, describing Freeflo pumps for sump, sewage and drainage service, has been announced by Worthington Pump and Machinery Corporation, Harrison, N.J. The manufacturer describes its FLJ and FLJD wet-pit pumps as having non-clogging sewage pump impellers capable of passing solids and stringy material. These pumps have a stuffing box above the impeller and the pump bearings are above and separate from the box. As the stuffing box is normally inaccessible, it is equipped with U-cup packing which requires no adjustment and which has proved its success in vertical turbine pumps handling sandy water. Bulletin includes a cross-section drawing, graph of coverage for 60-cycle motor speeds, dimensions in inches and data on flanges. A request on company letterhead will bring you a copy of this bulletin.

Rotary Scraper

The Miller rotary scraper is illustrated and described in a 4-page circular. This scraper has an automatic vane loading action that is claimed to eliminate drag and loading pressure by lifting the earth away from the cutting blade as it scrapes. This is accomplished by special steel vanes rolling forward, constantly clearing the blade of earth and depositing it in the hopper. Specifications are included for five models, 2 cu. yd. to 10 cu. yd. The Miller Rotary Scraper, Selma, Calif.

No Pushbeam Dozer

Complete details on the specifications and performance characteristics of the new Baker 9X bulldozer are given in Bulletin No. 896-A. This new dozer, by elimination of push beams, mounts an 8-ft. blade on the 70 drawbar hp. 9-ton Allis-Chalmers HD-9 tractor. Incorporating the Baker "Roll-Action," this narrower blade has approximately the same total blade area and capacity as the conventional 9-ft. 6-in. model for the HD-9 Tractor. On the 9-X mounted tractor, the dozer frame and tractor frame are bolted together as an integral unit. Thus, the tractor frame itself becomes the push beam. Baker Manufacturing Co., 502 Stanford Ave., Springfield, Ill.

Hardfacing Rod

A rod selection guide (Bulletin "SG") for "Amscoating" with Amsco hardfacing products has been released by American Manganese Steel Division of The American Brake Shoe Co. This chart breaks down into basic operations, the parts that can and should be hardfaced for longer life. The guide gives the name of the part, the recommended rod, sizes, and method of application. It also contains a description of the rods in the Amsco line. American Manganese Steel Division, Chicago Heights, Ill.

Lathe Attachments

More than 160 different attachments and accessories for South Bend lathes, drill presses and shapers are illustrated in a new 35-page catalog No. 5102. Several new items are catalogued, including some recently developed attachments not previously announced. Although these attachments and accessories are designed primarily for use on South Bend machine tools, many of them can be easily adapted to other makes. South Bend Lathe Works, 425 East Madison St., South Bend 22, Ind.

Aircomatic Equipment

A new catalog (Form ADC 717) on Aircomatic equipment and wires has been announced by Air Reduction Sales Co. The catalog describes the Aircomatic gun for manual operation, the Aircomatic head for automatic operation and the Aircomatic wires for use with either manual or automatic equipment. Photographs and sketches of the equipment are supplemented by on-the-job illustrations of a few of the many applications. Air Reduction, 60 East 42nd St., New York 17, N.Y.

Engineered Timber Construction

Dimension and design data for engineered timber construction are given in a recent 8-page brochure of Timber Structures, Inc. Included are descriptions and illustrations of glued laminated girders and beams, and glued laminated arches. Tables include: typical purlin sizes, typical haunch sections, Tudor arches, constant radius arches, and dimensions, sizes and weights of typical twin-truss arch teco roof trusses. Timber Structures, Inc., P.O. Box 3782-1, Portland 8, Ore.

Portable Material Elevator

Outstanding new features designed into this portable material elevator are graphically illustrated and simply described in a new 8-page catalog just released by American Hoist and Derrick Co., St. Paul 1, Minn.

Sand Blast Machines

The Ruemelin line of sand blast generators is illustrated and described in Bulletin 36-C. The machines are available in many sizes raging from 50 lb. to 2000 lb. of sand capacity. A new double compartment generator for continuous operation is described. Details of construction of the generators are given, as well as hose and nozzle recommendations and an air consumption table. One page is devoted to blast cleaning accessories. Ruemelin Manufacturing Co., 3860 N. Palmer St., Milwaukee 12, Wis.

Engines

Recent circulars are available on three Novo engines. These are the water-cooled 2-cylinder engines, Model CW-R-66; the air-cooled 1-cylinder engines, Model DA-33; and the water-cooled 2-cylinder Model CW-R-66, tractor fuel engines. Features of the engines are described and specification are given. General data on the engines also are included. Novo Engineering Co., Lansing 5, Mich.

Crane

The Bay City CraneMobile is illustrated and described in a 24-page catalog. Important features of machine include: 20-25 ton capacity, pin-connected boom, hi-collapsible gantry, independent boom hoist, precision power loading, removable counterweight, specially designed carrier, and high road speeds. Numerous illustrations show the CraneMobile on big construction job. Bay City Shovels, Inc., Bay City, Mich.

Revolver Cranes on Heavy Construction

A 24-page brochure contains pictorial stories of recent and current dam construction jobs where American revolver cranes are used. Interesting construction pictures are given for 12 large dam projects. Rated lifting capacities for the cranes are included in the brochure. American Hoist and Derrick Co., St. Paul 1, Minn.

Paving Products

An 8-page catalog on Sealtight paving products gives complete descriptions, helpful installation hints and ordering information on asphalt, fibre and cork-fill expansion joints, tongue and groove joints, dummy joints, concrete curing compounds, base plates, joint sealing compounds, sewer joint compounds, and zone marking paints. W. R. Meadows, Inc., Elgin, Ill.

Portable Electric Tools

The complete line of Black & Decker portable electric tools, attachments and supplies are covered in a 74-page catalog. Illustrations, descriptions and prices are included for drills, sanders, polishers, bench and portable grinders, screw drivers and nut runners, impact wrench, quick saw, hammers and valve reconditioning equipment. The Black & Decker Mfg. Co., Towson 4, Md.

WITH THE MANUFACTURERS & DISTRIBUTORS

Woodsum Joins Soil Testing Service. Harold L. Woodsum has joined the engineering staff of Soil Testing Services, Inc., Chicago, Ill. He formerly was associated with the Civil Engineering Department of Purdue University.

Promotions by American Steel & Wire. Promotions of three men to fill important posts in the Chicago district sales office of the American Steel and Wire company have been announced by John Graham, general manager of sales of this U. S. Steel subsidiary. Fred L. Nonnenmacher has been named manager of Chicago district sales succeeding E. A. Murray, resigned. Taking Mr. Nonnenmacher's place as manager of the manufacturers' products sales department in Chicago is S. W. Goodenough, while R. H. Hauger succeeds Mr. Goodenough as assistant manager of manufacturers' products sales.

Joins NPA. Frank Mussell, Eastern Territory Manager for Allis-Chalmers Tractor Division, has been appointed Director of Agricultural Machine and Implement Division of Industrial and Agricultural Equipment Bureau of National Production Authority, with headquarters at Washington, D. C.

Appointed Sales Manager. R. A. Otterness has been appointed sales manager for Contractors Equipment & Supply Co., Albuquerque, N. Mex.

Charles F. Smith Is Dead. Charles F. Smith, 70, president of the Smith Engineering Works, Milwaukee, Wis., died Dec. 10, at Pasadena, Calif., where he had gone early in November for his winter vacation. Mr. Smith was born in Wausau, Wis. His family moved to Milwaukee shortly afterward. A few years after graduating from the University of Wisconsin, he became vice-president and sales manager of the T. L. Smith Co., Milwaukee. In 1915, he became president of the Smith Engineering Works. He was also a vice-president of the Sterling Wheelbarrow Co., West Allis, Wis. at the time of his death. All three of these companies were founded by his father, Thomas L. Smith.

Loskill Promoted by Caterpillar. Robert J. Loskill has been named manager of the sales training division, Caterpillar Tractor Co., Peoria, Ill. Thomas A. Glass succeeds him as assistant manager of the governmental division, a position which Loskill held for the past three year.

Neville Becomes President. At a recent meeting, the board of directors of The Leece-Neville Co. elected P. H. Neville, 37, to the presidency. Neville moves up from his previous position of vice-president and secretary.

Chicago Metal Hose Changes Name. Effective Jan. 1, 1952, on the occasion of its Fftieth Anniversary, Chicago Metal Hose Corporation became Flexonics Corporation. Commenting on the change, J. F. P. Farrar, President, said that the spectacular growth of the company and

the development of varied product lines made it desirable to select a new corporate name more representative of the broad scope of company activities.

New Representative for Flexrock. The Mechanical Rod Packing and Building Maintenance Divisions of the Flexrock Co., Philadelphia 4, Pa., has announced the appointment of Hinds & Associates, Inc., of Kansas City, Missouri, as their exclusive representative in the states of Kansas, Nebraska, Oklahoma, Arkansas, and Western Missouri.

New Warco Sales Representatives. Leslie R. Davis has been appointed district sales representative for W. A. Riddell Corporation, Bucyrus, O. He will work with Warco distributors in the States of Wisconsin, Iowa, Minnesota, Nebraska, North Dakota and South Dakota. Garth N. Elmore has been appointed district sales representative and will work with Warco distributors in the territory of Michigan, Illinois, Indiana, Kentucky, West Virginia and Ohio.

Named Member Advisory Board. Harold H. Lurie, chief metallurgist, Cummins Engine Co., Inc., Columbus, Ind., has been named a member of a six-man Metallurgical Advisory Board to assist the United States Navy on a special technical project.

Appointed District Manager. Robert E. Kurrasch, formerly sales engineer with Unistrut Products Co., has been appointed Chicago district manager for Controls Division, Perfex Corporation, Milwaukee, Wis.

New Western Sales Representative. John H. Way, formerly member of sales staff of LeTourneau Distributor Contractors Equipment and Supply Co., Albuquerque, N. Mex., has been appointed district sales representative for R. G. LeTourneau, Inc., Peroria, Ill., with headquarters at Denver, Colo. His territory cover the states of Colorado, Wyoming, Montana and Idaho.

McPherson Promoted by Huber. Don McPherson, heretofore assistant district sales manager in the southern states for Huber Manufacturing Co., Marion, O., has been appointed district sales manager in the Northeastern district, which takes in all New England States, Maryland, New Jersey, New York, Pennsylvania and Virginia.

Elected Vice President. Joseph H. Humberstone has been elected a vice president of Air Reduction Co., Inc. He was formerly the president of the company's Airco Equipment Manufacturing Division and he has been succeeded in that capacity by Scott D. Baumer.

Universal Atlas Executive Promotions. Election of five executives to higher office by directors of Universal Atlas Cement Co., New York, N. Y., has been announced by Blaine S. Smith, president of this U. S. Steel subsidiary. Vice president and general sales manager George H. Reiter was elected to the newly-created office of executive vice president; vice president and assistant general sales manager Fred T. Wiggins to vice president and general sales manager; assistant to president and secretary Charles B. Baker to vice president and general attorney; assistant secretary Donald C. Leo to secretary; and attorney Edward D. Depew to assistant secretary; all with offices in New York City.

Schneider Joins Barnes Mfg. Co. William D. Schneider, formerly western regional sales manager for Flint & Walling Co., has been appointed national manager pump and water system sales for Barnes Manufacturing Co., Mansfield, O., with headquarters in Mansfield.

Appointed District Sales Representative. Garth N. Elmore has been appointed district sales representative for W. A. Riddell Corporation, Bucyrus, O. He will work closely with Warco distributors in the territory of Michigan, Illinois, Indiana, Kentucky, West Virginia and Ohio.

Appointed Manager A-C's English Plant. Elwyn Mercer, industrial manager of the Southwestern territory since 1947 of Allis-Chalmers Manufacturing Co., Milwaukee, Wis., left recently for England to become general Manager of Allis-Chalmers tractor division operations in that country. The Tractor Division has two plants in England. The one at Eling Mill makes Model B tractors, and the larger one at Essendine makes All-Crop harvesters and engines for both the harvesters and the Model B tractors.

Appointed Sales Engineer. Robert E. Cook, field engineer with The Timken Roller Bearing Co.'s Cleveland office, has been appointed sales engineer of the Steel and Tube Division of that company's Cleveland office.

Changes in B-G's Sales Organization. Major changes in the sales organization of Barber-Greene Co., Aurora, Ill., have been announced by W. B. Greene, president and co-founder of the company. W. B. Holder, formerly general sales manager, heads up a new division of the company, plans for which are now being formulated, details to be announced later. E. H. Holt becomes general sales manager, responsible for overall Barber-Greene sales policy and in direct supervision of the Aurora and domestic sales organization. J. D. Turner, becoming director of publicity and promotion, will supervise publicity and advertising and, in addition, will work closely with Holt on the formulation of overall sales policy and sales promotion.

New Advertising Manager. Carson L. Ruyle, heretofore of the sales division at the Quincy office of Gardner-Denver Co., has been appointed advertising manager of the company, succeeding Lt. Damon P. Tunnicliff, who has been called to active service in the Navy.

Parlon Named General Manager. William L. Parlon has been named general manager of Elbeeco, Inc., wholly owned subsidiary of Aeroquip Corporation, Jackson, Mich. He joined Aeroquip in June, 1951, as a project engineer.

McClellan Appointed Factory Manager. James B. McClellan has been appointed factory manager of Standard Steel Corporation, Los Angeles, Calif., in charge of all manufacturing activities.

Appointed District Manager. Sherman R. Lyle of the Cleveland office of The Timken Roller Bearing Co., Canton, O., has been appointed district manager of the Steel and Tube Division, Northern Pennsylvania and New York State District, with offices in Buffalo, N. Y.

New Koehring Distributor. A. F. Deaney Co., 719-721 North Pine St., Indianapolis, Ind., has been appointed exclusive distributor and representative in Indiana for the Koehring Co., Milwaukee, Wis., and will handle the complete Koehring line of heavy duty construction equipment. In addition to Koehring products, the firm also represents C. S. Johnson Co. and Parsons Co., both Koehring subsidiaries. The Deaney Co. will cover the entire State of Indiana with the exception of six counties in the northwest corner and six border counties in the southeast.

Worthington Promotions. Worthington Pump and Machinery Corporation, Harrison, N. J., has named seven plant executives to new posts. The new posts are: George P. Passmore, assistant to the vice president in charge of manufacturing at Harrison, N. J.; A. M. Tullo, works manager of the company's plant at Wellsville, N. Y.; John Burlick, assistant to the works manager at the Harrison plant, in charge of industrial engineering activities; Max A. Heyman, assistant to the works manager at the Harrison plant in charge of production control activities; W. D. Sizer, manager of regional engineering and service department, with headquarters at Harrison; George F. Haback, executive engineer at the Harrison plant; and Everett Schmachtenberg, chief engineer of centrifugal engineering at the Harrison plant.

New Sales Engineers for Darakote. Two new sales engineers have been appointed as part of the expanded distribution campaign for Darakote, anti-stripping compound, a product of Dewey and Almy Chemical Co., Cambridge, Mass. Arthur B. Summers, with headquarters at White Plains, N. Y., will serve customers in the eastern states. Serving customers in the West will be Frank D. Gaus. He will work from Dewey and Almy's plant of San Leandro, Cal.

Equipment and Material Notes

(*Continued from page 88*)

Cavity Resonators

Television interference caused by spurious and harmonic radiations of base station 2-way radio communications equipment can be eliminated by the addition of a Motorola precision selector cavity resonator, the company has announced. These units, now available from Motorola, minimize spurious and harmonic radiation from any transmitter antenna system and make it possible to use two or more transmitters on the same antenna without mutual interference. A cavity resonator is effectively a very high "Q" circuit which can be inserted into a line, connecting the transmitters and receivers with the antenna. Motorola Inc., Communications and Electronic Division, 4545 W. Augusta Blvd., Chicago 51, Ill.

Motorola Precision Selector Cavity Resonator

Reflectorized Paint for Highways

U. S. patents covering reflectorized paint for highway lane marking have been granted to Minnesota Mining and Manufacturing Co. The products, already in use for highway marking in many of the 48 states, is marketed by the company under the trademark "Centerlite." The patents, Nos. 2,574,971 and 2,574,972 were issued Nov. 13, 1951. The reflectorized material is applied like conventional lane marking paint, but lasts three to five times longer, and reflects over 300% brighter at night, according to the manufacturer. The product consists of a liquid containing millions of tiny glass speres which serve as reflex-reflecting lenses. Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn.

Chemical for Grass Control

A new chemical, known as maleic hydrazide, which shows the growth of grass, was revealed in the recent annual meeting of the Association of State Highway Officials, by one of its developers, Dr. John W. Zukel, of the Naugatuck Chemical Division of United States Rubber Co., New York 20, N. Y. Dr. Zukel reported on experiments conducted last year on its Wilbur Cross and Meritt Parkways in Connecticut. A total of 55 different plots comprising 74 acres were sprayed with maleic hydrazide between August, 1950 and October, 1951. Most promising results were obtained on 12 one-acre plots in the center islands, which were sprayed once with the chemical at the rate of 2 lb. per acre last May 2 and 3. According to the report, maleic hydrazide slowed down the growth of lawn grasses in these test strips to a point where only two mowings were needed throughout the year.

Anti-Friction Bearing Lubricant

A new premium anti-friction bearing lubricant—Texaco High Temp Grease—which considerably extends the efficient range of operation of ball, roller, and plain bearings at high temperatures has been announced by The Texas Co. The new grease exceeds established military and industrial standards in affording unusual protection at temperatures up to 300° F for continuous operation and 350° F for intermittent operation. Texaco High Temp Grease is the latest formulation in a premium line which has been marketed for many years by Texaco. The present formulation is the product of a research program which continuously reevaluates the company's greases in terms of field performance, new design needs, and research findings which result in improved components. The Texas Co., 135 East 42nd St., New York, N. Y.

PUT MORE

ACTION

IN COMPACTION

with BUFFALO-

SPRINGFIELD

Gardner

SEGMENTED ROLL

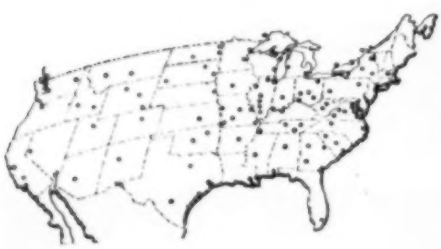
Official Tests Prove Buffalo-Springfield Gardner Roll Gives 3 to 7% Greater Compaction with Fewer Passes!

Actual tests, on projects under engineering supervision, reveal these important facts about this revolutionary new roll. When used in place of the smooth-faced guide roll on a conventional tandem, it increases compaction densities 3 to 7%, produces a better textured surface, less susceptible to traffic damage. Further—experience in compacting a variety of materials—including earth fills, stabilized bases and hot and cold mix bituminous—proves fewer passes are required to achieve specified densities.

Here's what T. F. Baun, president of Baun Construction Company, Fresno, California, says about performance of this great new roll on a recently completed California State Highway Project:

"The roll did an excellent job, both from an engineering and cost standpoint. We used it to compact the soil cement treated base, the plant mix base and the finish surface. In addition to saving the cost of other equipment, we got better compaction—in most cases with fewer passes—than if conventional type rollers had been used."

There's an Authorized Buffalo-Springfield Distributor Conveniently Located to Serve You



The Buffalo-Springfield Gardner roll is interchangeable with the smooth-faced guide roll on Buffalo-Springfield Tandem models KT-19, KT-20, KT-24B and KT-25B tandem rollers. It is also furnished for previously manufactured Buffalo-Springfield models KT-24 and VT-30.

Investigate the time-and-money saving, quality-improving advantages of the Gardner roll. See your Buffalo-Springfield distributor, or write direct.

BUFFALO SPRINGFIELD

THE STANDARD OF COMPARISON

SPRINGFIELD, OHIO

WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF ROAD ROLLERS

High Speed Paver

A new Worthington-Ransom 34E dual drum paver, announced by Worthington Pump and Machinery Corporation, has been designed with ultra high speed operating cycles. Typical of the speed claimed for the new Model WP paver is a boom bucket travel rate of 256 ft. per minute. The power loader skip requires only 6½ seconds to travel from the ground to

Model WP Paver

discharge position of 56 degrees low slope. Transfer from the first to the second mixing compartment also requires about 6½ seconds, depending upon consistency of the concrete. Discharge into the boom bucket is another 6½ second operation. Boom swing is a full 171 degrees. The new paver retains the exclusive hydraulic bucket, permitting complete control of rate of concrete discharge under all conditions. Increased braking area, more efficient boom raising and lowering machinery, a redesigned drum, and entirely new crawlers and frames are other features of the new machine. Construction Equipment Division, Worthington Pump and Machinery Corporation, Dunellen, N. J.

10 Cu. Yd. Shovel

A new 10 cu. yd. mining and quarry type machine described as the world's largest shovel on two crawlers has been announced by Marion Power Shovel Co. Features claimed for this new Marion 191-M include the following: A 10 cu. yd. heavy duty shovel with small-machine cycle time. More strength and more power, in terms of digging effort and speed, per cubic yard of capacity. Greater travel speed and maneuverability than most small machines. Loads trucks of the 50-ton class in three or four passes. Loads gondola rail cars quickly. Heavily built throughout for the world's toughest digging jobs. Electric or diesel electric power. Ward-Leonard control. "Amplidyne" or "Rototrol" application of electric power. The 191-M is basically a full electric machine with Ward-Leonard controls. It is equipped with "Amplidyne" or "Rototrol" high speed electrical controls to permit operating speeds that would otherwise be impractical in such large, heavy assemblies. High voltage line current is converted into direct current for powering the operating motors. Separate motors and generators operate the hoist, crowd and swing motion, and there is an "exciter" for each generator combination to make the motors immediately responsive to the operator's controls. For use in areas where electric power is not available, the 191-M will be furnished as an all diesel-electric machine, with diesel engines drving the DC generators. The first of the 191-M machines is diesel-electric. Marion Power Shovel Co., Marion, O.

Fork Lift Trucks

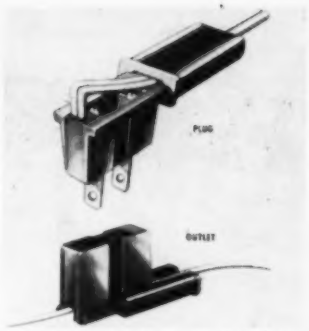
A new series of fork lift trucks, completely new from the ground up and embodying the latest advancements in engineering, styling, accessibility and operating work performance, has been announced by The Buda Co. The new Buda

Model FT30-24, 3000 lb. capacity truck

"safelined" designed FT series of fork lift trucks powered with either a Buda Diesel or Buda gasoline engine, are available in 12 models on solid or cushion tires in capacities of 3000, 4000, 5000, 6000 and 7500 lb. at a 24 in. load center and 4000 lb. capacity at an 18 in. load center. The series are all available in five standard masts with a 72 in., 84 in., 108 in., 114 in. or 120 in. lift. The Buda Co., Harvey, Ill.

Electric Plugs and Outlets

A new and ingenious type of electric plug or outlet that can be attached in five seconds to any standard No. 18 lamp or appliance parallel cord is illustrated.

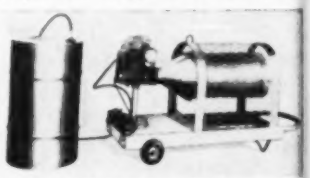


"Slide-On" Electric Plug and Outlet

Simply lay parallel wire in channel on top of the moulded base and slide cap into place. This forces internal contact points to pierce the insulation, making safe, positive connection. Outlets can be removed and attached elsewhere without exposing bare wire or damaging electrical cords. No tool required. It eliminates slitting wires apart and stripping off insulation. No screws or assembly are required. Greatly reduces production time for assembling conventional plugs or outlets. Gilbert Mfg. Co., Inc., Long Island City 3, N. Y.

Portable Space Heater

A new model compact portable space heater of the radiant type has been announced by Quiet Automatic Oil Burner Corporation. Designated as No. 200, this



Model 200 Space Heater

portable unit is rated at 189,000 B.T.U. It is capacity equipped with solenoid valve and the Quiet automatic oil burner. Its efficiency is stepped up by the unique feature of the combustion chamber which incorporates a split baffle that circulates air around the outside of the chamber and at the same time supplies air to the burner for combustion purposes. The unit is mounted on a two-wheel chassis. Quiet Automatic Oil Burner Corporation, 33 Bloomfield Road, Newark, N. J.

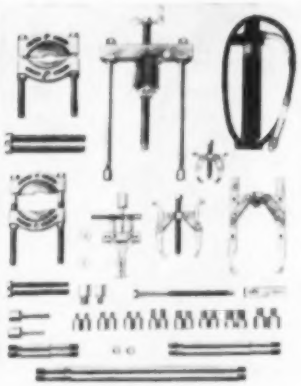
Multi-Purpose Grease

An improved multi-purpose grease for use in general industrial applications—Texaco Multifak 2 Grease—has been introduced by The Texas Co. It is recommended for use in situations which require one high grade multi-purpose grease for a variety of operations. Research officials responsible for the new formulation point out that Multifak has excellent shear stability, outstanding resistance against water washing, and good pumpability at low temperatures. It is highly suitable for bearing lubrication over a wide range of temperatures and can be used efficiently for an extensive variety of industrial lubrication jobs. The Texas Co., 135 East 42nd St., New York, N. Y.

Marion 191-M Diesel Electric Machine Loading 50-Ton Euclid Rear Dump Truck

Tractor Service Tools

A new set of Caterpillar tractor service tools designed especially for use with the new OTC power-twin hydraulic puller—a 17½ ton hydraulic ram—has been announced by the Owatonna Tool Co. The set contains the minimum assortment of pullers, adaptors and attachments which have been tested and found essential to service Caterpillar tractors. Owatonna Tool Co., 435 Cedar St., Owatonna, Minn.



OTC Tractor Service Tools

New Attachments for "Agricat"

Three new attachments for the "Agricat," a 6 ft. long crawler tractor, have been announced by Earl H. Pence Co. They consist of a 5 cu. ft. high lift, hydraulic operated front-end bucket, a rotary broom, and a 4 cu. ft. hydraulic-operated front end bucket. The 5 cu. ft. capacity high lift bucket is powered by a Vickers 1000 lb. per square inch pump, feeding into two rams whose pushing capacity is 491 lb. per 100 lb. pump pressure, and a pulling capacity of 368 lb. per 100 lb. pump pressure. The high lift bucket lifts to a height of 68 in. from the ground level, and is capable of being lowered 4 in. below track level. Earl H. Pence & Co., Inc., 2150 Washington Ave., San Leandro, Calif.

5 cu. ft. High Lift Bucket for Agricat

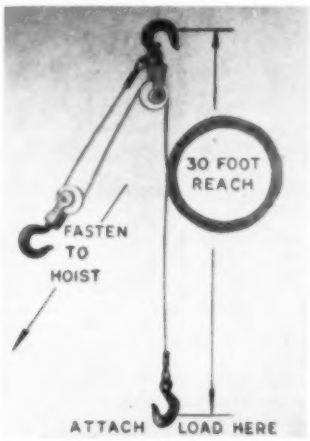
Air-Powered Tree Saw

Addition of a new, lightweight air-powered hand pruning saw with cutting capacity to 6 in. has been announced by the Miller-Robinson Co. The saw weighs only 5½ lb., and standard length is 36 in., but several lengths are available depending upon the purpose required. It is easily handled, operates at 1500 strokes per minute and will not buck, chatter or bind, according to the manufacturers. Blades are easily removed for sharpening when necessary. Several types of economical blades are also available for various types of work. Any self-contained power air source or power take-off compressor with capacities from 8 to 30 CFM, depending upon units supplied, can be used as a power source. Miller-Robinson Co., 7021 Avalon Blvd., Los Angeles 3, Calif.

New Air-Powered Tree Saw

Accessory Provides 30-ft. Lift

A new accessory (The Longlift) for the Lug-All hoist makes possible a 30 ft. lift. Operation is normally from the ground. Only the 6 lb. Longlift need be taken up the ladder for overhead suspension. Capacity is 750 lb., and minimum distance between hooks is only 10 in. Especially designed for the Longlift is the 8½ lb. Lug-All winch-hoist mentioned, though any hoist with a minimum lift of 15 ft. may be used. The Lug-All Co., 331 E. Lancaster Ave., Wynnewood, Penn.



Lug-All Longlift

Compression Pipe Coupling

A new style compression pipe coupling, claimed to materially reduce corrosion to practically eliminate turbulance at the pipe joint has been announced by Morris Coupling & Clamp Co. The coupling is made up of three parts: 1) a gasket made of the material best suited to give protection for the specific job application, 2) steel inner sleeve with precision die-cut teeth placed eccentric to the gasket teeth to form a complete seal when the outer shell is tightened, and 3) steel outer shell made of zinc coated steel or corrosion resistant metals when required, with zinc coated washers, bolts and nuts. The coupling is made in sizes from ⅛ in. to 14 in. standard pipe sizes, including intermediate tube sizes. It will couple ferrous to ferrous or ferrous to non-ferrous materials. It couples threaded to non-threaded pipe as easily and safely as threaded to threaded. Morris Coupling & Clamp Co., P. O. Box 632, Ellwood City, Pa.

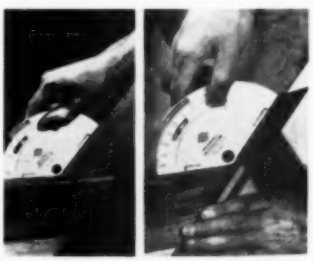
15-Ton Truck

A new truck, announced by Cook Bros. Equipment Co. is designed especially for work where a short wheelbase and large payload capacity are of prime importance. The unit shown has a lightweight, high-tensile steel dump body with a legal payload capacity of 15 tons. The wheelbase is 174 in. and the truck is equipped with Cook Bros. dual hydraulic hoist and Cook Bros. dual gear drive. The "M310" trucks will also be available with a single driving axle or single driving axle and third axle attachment. Cook Bros. Equipment Co., 1815 North Broadway, Los Angeles 31, Calif.

M 310 Cook Bros. Truck

Mechanics Protractor

A handy mechanic's protractor designed for on-the-job measuring of angles up to 180 degrees is made of durable Vinylite plastic rigid sheet that has exceptional dimensional stability and is highly resistant to water, oil, grease and most chemicals. The protractor simultaneously gives three readings: for an outside angle, for the adjacent inside angle, and for inches-per-foot against degrees—all with one setting. Spread with edges squarely against sides of an obtuse joint (left illustration), measurement of the adjacent acute angle—angle of bend or deflection—is read from the top row of calibration, while measurement of the obtuse angle itself is read simultaneously from the bottom row. Inches-per-foot of pitch is indicated by a second arrow on a separate



How Mechanics Protractor Is Used. Left: Use on Obtuse Joint. Right: Measuring Inaccessible Acute Angles

scale which runs up to 24 in. per foot, for 63 degrees and 26 minutes. To measure certain inaccessible acute angles, a straight edge may be used to extend one side of the angle (right illustration). Where the protractor itself cannot be used, the angle may be taken with a carpenter's bevel and the angle of the bevel measured with the protractor, using the middle row of calibrations. Interstate Sales Co., 123 East 18th St., New York 3, N. Y.

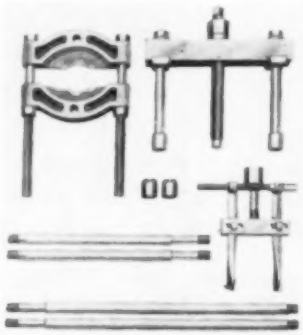
Chain Saw

A new light-weight, two-man chain saw, which can be operated with ease also by one man and yet does the heaviest of heavy-duty jobs, has been put on the market by Henry Disston & Sons, Inc., Philadelphia, Pa. The saw, the latest in the Disston line, is the DA-211 intermediate. For easy carrying over the steepest, roughest terrain, the saw, powered by a 9 h.p. Mercury engine, knocks down into two sections less than 35 lb. each. Perfected after two years of experiment and tests under actual cutting conditions, the DA-211 Intermediate has automatic clutch, automatic chain oiler, non-clogging air intake, oversized cooling fan and simplified controls.

Disston Saw Making Limbing Cut

Tractor Service Tools

A new set of Caterpillar tractor service tools developed with the cooperation of Caterpillar service engineers has been announced by Owatonna Tool Co. The set contains tools designed for use on the larger Caterpillar tractors such as the D8, but especially on the DW-20 and DW-21. The tools provide a wide range of utility and handle most of the pulling and installing operations involving gears, bearings, pulleys, shaft, sprockets, bearing outer races, bushings, etc. Owatonna Tool Co., 435 Cedar St., Owatonna, Minn.



Service Tools for Larger Caterpillar Tractor

New Federal Trucks

Production of its new 3400 series Style Liner models with advanced design "Power Chief" valve-in-head engine, has been announced by the Federal Motor Truck Co., Detroit, Mich. Of special significance is the high power output and comparative low chassis weight of these vehicles. The new series will be comprised of three models, 3401, 3402 and 3404, all of which represent important additions to the Federal line. Gross vehicle weights range from 23,000 to 25,000 lbs., with tractor-trailer ratings to 45,000 lbs., depending on models. Units will be available in eight wheelbase lengths from 136 in. to 250 in. with cab to axle dimensions from 60½ in. to 174½ in. Chassis and cab weight of shortest wheelbase 3400 series units start at 7,210 lbs.

New Federal 3400 Series. Tractor Shown Has 136 in. Wheelbase

$810,000,000 Federal Aid

(*Continued from page* 52)

and Indian lands, there should be authorized $10,000,000 annually; (f) and that for roads on unappropriated public lands, as delineated in the Federal-aid Highway Act of 1950, there should be authorized $5,000,000 annually.

5. For the section of the present Federal-aid Highway Act relating to emergency relief fund for national disaster, as set forth in the Act of 1950, there be authorized $15,000,000.

6. Not more than 25% of the amount apportioned to each State for the Primary and Secondary systems may be switched from one system to the other, provided the State Highway Department makes such request and it is approved by the Commissioner of Public Roads in the public interest.

7. These recommendations should be applicable for the fiscal year ending June 30, 1954, and for the fiscal year ending June 30, 1955.

Pooling of Ideas and "Know-How" is AASHO Asset

The unique make-up of the American Association of State Highways Officials as a clearing house for ideas and facts was spotlighted at the recent Omaha meeting. The member departments include the 48 state highway departments, the U.S. Bureau of Public Roads, and the highway departments of Porto Rico and Hawaii.

"The Association's work through year-around standing committees," as told at the recent Omaha convention, "is a manifestation of the cooperative spirit that has made the nation's present highway system and advanced state of the roadbuilding science and art possible. AASHO sets a pattern of partnership in a common cause which counties, cities and other governmental agencies totaling over 30,000 with road jurisdiction can well follow."

These are the 3 principal committees and 18 sub-committees and operating committees of the Association:

Executive Committee, the Association's governing body. President B. D. Tallamy (N.Y.) is ex-officio chairman. Members include the five vice presidents and ten other members. Hal H. Hale, executive secretary of the Association, is committee secretary, and George H. Henderson, Rhode Island, is Treasurer.

Committee on Administration. S. C. Hadden (Ind.) chairman, C. W. Phillips (Pub. Rds.) secretary. It works through 8 sub-committees, respectively on administrative practices, highway finance, highway transport, legal affairs, right-of-way, uniform accounting, public relations, and factual surveys.

Committee on Standards. H. E. Hilts (Public Roads) chairman, Joseph Barnett (Pub. Rds.) secretary. Membership comprises chairmen of ten operating sub-committees, on planning and design policies, construction, materials, traffic, bridges and structures, design, maintenance and equipment, roadside development, construction and maintenance of secondary roads, and research.

Administrative Practices. D. C. Greer (Texas) chairman, W. L. Haas (Pub. Rds.) secretary.

Highway Finance. G. T. McCoy (Calif.) chairman, G. P. St. Clair (Pub. Rds.) secretary.

Legal Affairs. C. C. Bowles, of Virginia, chairman. L. E. Boykin (Pub. Rds.) secretary.

Right of Way. F. C. Balfour (Calif.) chairman, D. R. Levin (BPR) secretary.

Highway Transport. R. C. Keeling (Kan.) ch., C. F. Rogers (BPR) sec.

Public Relations. R. H. Smock (Penn.), died recently, successor not named, chairman, R. E. Royall (BPR) secretary.

Uniform Accounting. W. J. McDonald (Mich.) chairman, H. R. Wilson (BPR) secretary.

Factual Surveys. F. N. Barker (Ill.) chairman, T. B. Dimmick (BPR) secretary.

Planning and Design Policies. H. E. Hilts (BPR) chairman, Joseph Barnett (BPR) secretary.

Construction. C. M. Hathaway (Ill.) chairman, T. B. Dimmick (BPR) secretary.

Materials. F. V. Reagel (Mo.) chairman, F. H. Jackson (BPR) sec.

Traffic. Harry E. Neal (Ohio) chairman, Charles W. Prisk (BPR) secretary.

Bridges and Structures. Raymond Archibald (BPR) chairman.

Design. E. L. Roettiger (Wisc.) chairman, D. W. Loutzenheiser (BPR) secretary.

Maintenance and Equipment. R. H. Baldock (Oregon) chairman, H. A. Radzikowski (BPR) secretary.

Roadside Development. J. L. Wright (Conn.) chairman, W. H. Simonson (BPR) secretary.

Secondary Road Construction and Maintenance. R. A. Harris (Miss.) chairman, A. C. Leonard (BPR) sec.

Research. H. F. Clemmer (D. of C.) chairman, in cooperation with Highway Research Board.

Meetings Ahead

AMERICAN ROAD BUILDERS ASSOCIATION—50th Anniversary Convention, Rice Hotel, Houston, Texas; January 21-24.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS—Annual Meeting, Netherland-Plaza Hotel, Cincinnati, Ohio; Jan. 28-30.

ASSOCIATED EQUIPMENT DISTRIBUTORS—Annual Convention, Stevens Hotel, Chicago; Jan. 27-31.

ASSOCIATED GENERAL CONTRACTORS OF America, Inc.—Annual Convention, Statler Hotel, Detroit, Mich.; February 25-28.

ASSOCIATION OF HIGHWAY OFFICIALS OF NORTH ATLANTIC STATES—Annual Convention, Hotel Traymore, Atlantic City, N.J.; March 5-7.

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4 Caterpillar D4
3 International TD 18
7 International TD 14
8 International TD 9
30 International T9
21 Allis-Chalmers HD 10
27 Allis-Chalmers HD 14
3 Allis-Chalmers HD 19

EXCAVATORS

6 Bucyrus Erie 15B Draglines ½-yd
6 Insley K12 Cranes, ½-yd
1 Insley K12 Backhoe, ½-yd
1 P & H Dragline, ½-yd
1 Byers 65 Crane, ½-yd
2 Osgood 200 Cranes, ½-yd
1 Bay City 15A Truckcrane, ½-yd
2 Michigan TLDT 20 Truckcranes, ½-yd
1 Link-Belt MS70 Cruiser Crane, ½-yd
1 Link-Belt HC70 Truckcrane, ¾-yd
3 P & H 255A Cranes, ¾-yd
2 Byers 83 Shovels, ¾-yd
1 Northwest 25 Crane, ¾-yd
1 Koehring 304 Crane, ¾-yd
1 Link-Belt LS85 Crane, ¾-yd
1 Keystone 18A Crane, 1 yd
1 Bay City 65 Crane, 1¼-yd
2 Northwest 80D Barge Mount Draglines, 2½-yd
4 Northwest 80D Draglines, 2½-yd

ROAD ROLLERS

1 Huber, 10-ton
1 Galion, 10-ton
3 Austin Western, 10-ton
4 Buffalo Springfield, 6-8 ton

MOTOR GRADERS

9 Caterpillar 12
4 Galion 101
1 Galion 201
2 Adams 412K

SCRAPERS

6 Super C Tournapulls, 12-yd
2 Wooldridge Terracobras, 15-yd
7 LeTourneau D, 4-yd
33 LeTourneau LS, 8-yd
2 LeTourneau FP 14-yd
1 LeTourneau SU 12-yd
7 Wooldridge BBS, 9-yd
3 Wooldridge BBU, 12-yd
2 LaPlant Choate C84, 12-yd
5 Garwood 511, 10-yd
3 Slusser McLean, 10-yd
6 Daniels 811, 9-yd

MISCELLANEOUS

3 BC 31 Athey Dump Trailers
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Oliver Cletrac "AG-6" Model AGH Serial #3x8192 with ⅝ cu. yd. Wayne loader with street pads. Condition good.

Rogers Low-boy, 1948, semi trailer (long) tandem axles, 8-7.50x18 14 ply tires, Air brakes, reflectors, side brackets, side planks, spare tire and rim. Condition good.

1947 GMC 622 tractor, 40.8 H.P., air and vacuum, fifth wheel, saddle tanks. Condition good.

1947 Jeep with dozer blade, down pressure. Condition fair.

Trailer suitable for hauling D-4, Cleveland trencher, etc., 8-7.50x20 tires. Pull with dump truck. Condition good.

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25 ton Browning loco. crane new 1942
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Manitowoc 2000 cranes 1½ yd. 80 ft. bm.
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Bay City 20 ton truck crane new 1949
60 HP American 3 drum gas hoist

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3—TD-18 International Tractors—2 with DDPCU. One with Bucyrus-Erie hydraulic dozer blade. One angle dozer blade—Two with 15 cu. yd. Le Tourneau scrapers. All Rebuilt in A-1 Top Condition.

HD-14C Tractor Torque-convertor with Le Tourneau Scraper
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225 GM Diesel ¾ yd.
CATERPILLAR D6 Tractor with angle dozer and Hyster winch.
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Cat Diesel.

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1—A. C. Gas Motor Grader.
1—Cat. #10 Motor Grader.
2—10-Ton 3 Wheel Huber Rollers
1—100 Sullivan Compressor.
1—105 Jaeger Compressor.
1—60 Jaeger Compressor.
1—HD 7 Tractor w/Hydraulic Blade.
1—½ Yd. Clamshell Bucket.
1—Cedar Rapids Portable 10 x 20 Crusher 24' Elevator—Gas Power Unit.
1—New 402 Gallon Motor Grader.
1—New #26 Bros Steam Generator.
1—New #75W Haiss Bucket Loader.
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1—Cleveland Push Planer, 18 to 24' cutting width
3—Barber-Greene Ditchers
1—Whiteman Rodding Machine
3—Bell Prime Movers
1—"Harsoco" Vertical Drill
1—22 Ryerson Friction Saw
1—Jaeger Form Tamper & Oiler
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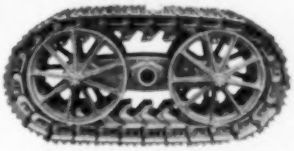

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Available Northwest machines in all sizes as of November 1st, 1951. All machines are sold f.o.b. cars and subject to prior sales. Every machine is in excellent mechanical condition and is a late model, and diesel powered.

Two 1951 Model 95 draglines 85 ft booms 2½ yd bkts
Two 1950 Model 95 draglines 80 ft. booms 2½ yd bkts
Two 1949 Model 95 Draglines 80 ft booms 2½ yd bkts
One 1948 Model 95 dragline 80 ft booms 2½ yd bkts
Two 1951 Model 85-D shovels
Two 1950 Model 80-D shovels light plants
One 1948 Model dragline 80 ft booms 2 ½ yd bkts
Two 1951 Model 80-D shovel
One 1949 Model 80-D shovel
Two 1948 Model 80-D shovel-draglines 75 ft booms
One 1947 Model 80-D shovel-dragline 75' boom
One 1951 Model 6 shovel
Two 1948 Model 6 shovels
Two 1948 Model 6 shovel-draglines 60 ft booms
One 1947 Model 6 Clam-drag 60 ft boom 33" cats
One 1950 Model 6 shovel
One 1948 Model 6 pullshovel—rebuilt
One 1950 Model 25 pullshovel—28" cats
One 1949 Model 25 pullshovel—28" cats
Two 1949 Model 25 shovels
One 1949 Model 25 Sh-CS-D1 40 ft boom 28" cats
One 1948 Model 25 pullshovel 28" cats
Two 1948 Model 25 Clam-drag 40 ft boom 28" cats
One 1947 Model 25 Clam-drag-crane 50 ft boom 28" cats
One 1947 Model 25 dragline-pullshovel 28" cats 40 ft B
Two 1947 Model 25 pullshovels
One Model 4 pullshovel. Attachments. 1946 Model

Many of the older and discontinued models are available in all sizes, and attachments (shovel—pullshovel-dragline and clamshell) are ready for immediate shipment, except pull-shovel attachments for 80-Ds or 95s. We specialize in Northwest equipment and will mail our complete list upon application. It covers eighty-five machines plus attachments.

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4—TD-14s
5—TD-9s
8—Model A IHC Wheel Tractors
2—Model 1-4 IHC Wheel Tractors
2—Model FCUB Farmalls
2—Model 10—Unitow Tractors

GRADERS:

1—Adams Model 414
1—Adams Model 512
1—Adams Model 550

MAINTAINERS:

2—Adams Model 125
2—American Model 800

CRAWLERS LOADERS:

1—B/E on TD-9
1—Service Supply on TD-9
1—Hough on TD-9

WHEEL LOADERS:

1—Hough Model HYD
1—Hough Model HM

SPECIAL
1—LS-51 Link-Belt Speeder

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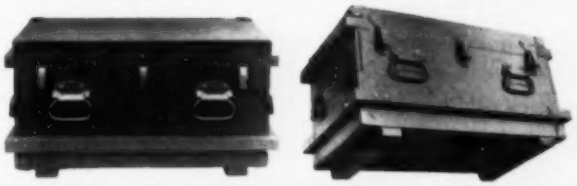

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